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says Mr. A. L. Courter, Hess-Goldsmith & Co., Inc.

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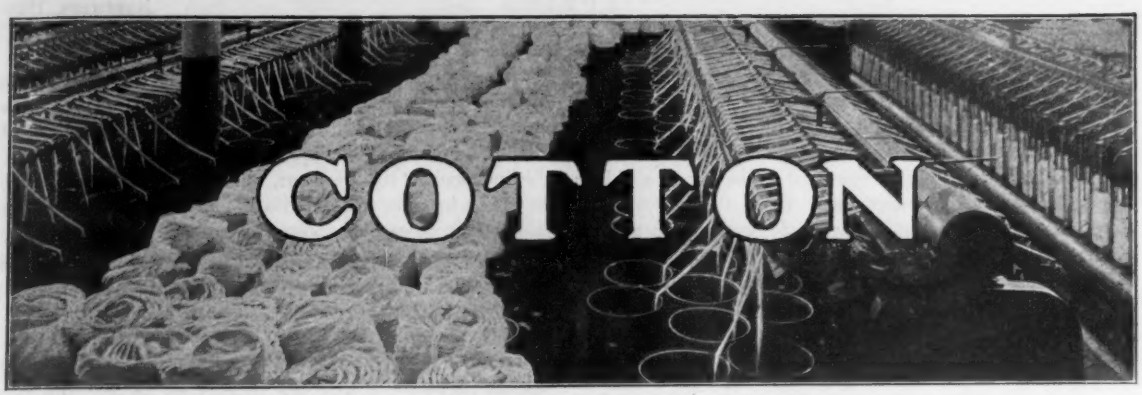


November, Nineteen-Twenty-Six

A Gesture at a Grab.

The American Federation of Labor's "stand" for a five-day week with only 40 hours of work, coming on the heels of Mr. Ford's announcement of a program of that sort in his shops, has caused students of economics to do some applied thinking. The move on the part of both organized labor, and the foe to whose policies it points to most frequently as providing proof of its tenets, are of the nature more of empty gestures than seriously made advances. It is well known that Mr. Ford's sales have been falling below the productive power of his established facilities, and that his five-day week was achieved by virtue of necessity for restricting output. It had been in effect for sometime; he merely provided a pretext for a shut-down one day in the week, as wages were not augmented to cover the lost day.

The A. F. of L. came out for it as a general policy simply because, old demands having been won—by forces with which it had little to do—or worn to shreds, it had to 'come out" for something to justify the agitation on which most labor organizations depend for life.

A five-day and 40-hour week throughout industry might mean several things, not all of them beneficent even from the workingman's point of view. Among them are:

1. A lowering of production, with a resultant lowering of the standard of living for a great many people. If these happened not to be the benefitting workers it simply would be because of the latter procuring unneeded idleness at the expense of more work for less money by others.

2. A big increase, by subterfuge, in the wage cost of production. For if output were sustained, or increased, as is necessary if standards of living continue to be raised, such, in the present state of affairs, would be by virtue of over-time employment at a wage premium.

3. An addition to the already puzzling leisure time for the use of which its beneficiaries have not been properly prepared.

Under the first item there no doubt would be on the whole a further augmentation of the already too big "slice" which the urban population is taking out of the national "pie," thus bringing about an uneconomic distribution between town and country—which situation constitutes the biggest national problem now at hand. This condition is attributable in the main to excessive wage scales and uneconomic cutting of working time in many urban industries.

The second, which merges with the third, probably is the main incentive behind the A. F. of L.'s demand. The bulk of intelligent workers would simply be bored miserably if forced to be idle during all but 40 of the 168 hours of each week. Most of them of course would work overtime or would find other employment in off hours, with the result, in the final summation, the same, except as to forced increases in wage returns for them.

Barring persons in occupations that impose abnormal strains, it is probable that the run of human beings, at their present state of evolution, must be busy at least eight hours a day on the average if good mental, physical and moral health is preserved by them. In excessive idleness there are more dangers than in excessive toil.

If working men want brief working days or weeks let them concentrate on so speeding up production that curtailment of operating time will be made necessary in order to keep output in harmony with consumption. In fact, that is what has brought about reduction in working hours with advances in pay. After all, wages are nothing but the things produced.

Keep Taxes at the Minimum.

Those in charge of the Federal Government having, it might be said, been tired out by the almost perpetual work of cutting taxes, are now apparently arrayed against all suggestions that further curtailments of Federal tax revenues be made. This despite the fact that surpluses still are yielded by the taxes.

There is a good deal in the claim of Secretary Mellon and those close to him that Federal tax rates should be let alone for a while. It is by no means assured that business conditions that have supplied tax yields beyond the expected will continue indefinitely and surpluses can be well applied to reductions, beyond schedule, in the national debt.

The less the tax burden, however, the more likely are good business conditions to continue; for nothing is relatively so handicapping as the toll which goes, via taxes, into non-production. The national debt has been curtailed remarkably, about one-fifth, since the war, and, in view of the country's present wealth, it is not as large one as has been carried at other times with ease. Rapid curtailment may have a deflating effect on prices. Moreover, a large debt is the best of deterrents to further debt making.

Any further tax reduction of consequence no doubt will

be in the corporation income tax which has remained practically as it was in the war time. There are many objections to this tax and any move towards its elimination is timely. It causes successful corporations to be conducted, in substantially one-eighth extent, so far as earnings go, for the support of the Government. The tax is a hidden and therefore a dangerous one.

Those who believe in the protective system had best beware of tax surpluses from such sources as corporation earnings. They are an incentive to cutting the tariff duties, for which purpose, be it remembered the present scheme of Federal taxes on incomes was originated. A lot of folks, otherwise favorable, are not likely to see virtue in tariff taxes to build up Treasury surpluses.

The strongest argument of all against surpluses is in the ever present temptation to use the funds in setting up new and continuing spending operations, meaning usually additional meddling by the Government.

Judge Elbert H. Gary.

For a man at 80 to be still the head of the country's biggest single corporate enterprise with no thought of "retiring," evidences in itself unusual virility and courage. But for one who was not primarily a "business man" to have been the chief human factor in bringing that enterprise through the difficult shoals that beset its early progress is evidence of something akin to genius.

In a large sense, current industrial America dates from the formation of the United States Steel Corporation, the "billion-dollar" manufacturing entity which comes as nearly as any ever did to being truly a "trust." When organized, it seemed to embody a serious threat and one that, under managements like some it took the place of, it might have so eventuated.

It is to Judge Elbert H. Gary, for long chairman of its board, that the "Steel Trust" owes more than to anybody else credit for its good standing. That it has been conducted usually with conscientious regard for the public interest as well as profit is now generally agreed. And such has proved to be highly profitable; it thereby has well emphasized, if not taught, a lesson of great worth to industrial management generally.

Judge Gary is more than a great business man; he is, in the full sense of the awkward term, a business statesman.

A Matter of Honor

The trial of two former high officials of the Government —one of whom once administered the U. S. Department of Justice—on charges of bribery in connection with the handling of property of enemy aliens seized during the war should bring to point an important question of national honor.

These properties were taken over for administration by warrant of laws thoroughly sound. The purpose was to prevent their use against the interests of the country during the war and to protect them against the hectic fevers of the time. American properties in enemy countries were similarly seized and administered. These amounted to considerably less than enemy alien properties in this country. It is noteworthy that there has been no outcry on the score of abuses of American properties in former enemy countries. There have been many on the score of alleged abuses of alien properties seized in this country.

Those properties, representing huge foreign investments making for American development and prosperity, were acquired or established by foreigners under obligations of honor that were as binding in war as in peace times. No feeling against the Germans, nothing which our war enemies did in other matters, justify any failure to keep our obligations concerning those properties.

That these obligations have been treated lightly seems clear. War fever, still not fully subsided, has tended to still America's inherently high sense of honor in the premises.

It is a subject which the American business world should inquire into with the view of seeing that full justice is done—to those former enemy aliens whose properties may have been misused, and to those who have been careless of the country's honor in the premises.

For, aside from the question of national self respect the United States will be in a relatively new situation when another war comes. The "big end" in the matter of seizures then quite probably will be in the hands of our enemies. If we don't see to the keeping of honorable obligations now we will have no right to ask that they be kept then.

Here's a good job for the United States Chamber of Commerce, in the performance of which it might render a truly big and unselfish service.

Unfair Comparisons.

Many persons in talking or writing about public affairs make what seem to them telling points by comparing the financial operations of the Federal with those of the State and local governments. They show how in recent years the Federal Government has reduced expenditures, cut taxes, curtailed its debt, while the reverse has been done by the other units of Government. The weakness of the comparison is in that it is for a period arbitrarily selected. If it were for fifty years or a hundred years the showing might be quite different.

And if made on the basis of objects of expenditure it would be superlatively different. More than 80 per cent. of Federal Government revenues go for interest and salaries and pensions—non-productive purposes. Probably as large portion of the revenues of State and local governments go for purposes that may be rated as constructive; that is, for schools and roads and public improvements generally.

Undoubtedly the States, counties and cities have gone too far or too rapidly in borrowing money and raising taxes on account of expansions many of which could have been achieved at much less cost had they been delayed. And some no doubt are unnecessary if not undesirable. Yet it should not be forgotten that while the Federal Government was expanding at a rate unprecedented, in connection with the war, other governmental units stood aside and deferred much ordinary activity. Hence in a way they have been only catching up and have not yet caught up with the Federal establishment.

Comparisons on unfair premises merely exalt and obscure faults and shortcomings at the top of the governmental structure.

Measuring Machine Running Time

BY RALPH W. BUMSTEAD

PRODUCTION ENGINEER AND CERTIFIED PUBLIC ACCOUNTANT

The term "Machine-Hour" is a time unit commonly applied to the time in which a machine is engaged for productive purposes. It usually includes a certain amount of machine idleness, although it should not include stoppages of comparatively long duration for repairs, lack of material or absence of the operative. The term "Running-Machine-Hour" will frequently be used in this discussion to designate the actual running time of a machine, not including any moments of stoppage for any cause whatsoever. For brevity this running-machine-hour may be called r.m.h and the total accumulation of running-machine-hours may also be expressed as so many r.m.h.

Machine Efficiency.

When an accumulation of running-machine-hours is divided by the total machine-hours for any particular machine or group of machines, the exact machine efficiency is obtained. In the simpler types of belt driven machines the r.m.h. measurement corresponds with the total time of running on the tight pulley and the working hours include the r.m.h. plus the total time of running on the loose pulley. Other types of machines are not necessarily productive at all times while running on the tight pulley. The r.m.h measurement for these machines should be confined to the periods of actual productivity. Thus, an accurate measurement of the r.m.h. of a cotton or woolen card requires specialized means for registering the running-time only when the product is being delivered by the machine and not at all when the card is running for the purpose of grinding or stripping the card clothing.

A New Wage-Rate Unit.

The running-machine-hour constitutes a wage-rate unit which is universally applicable to all operations of machine tending. This unit when used in place of units of production for piece-work wages has a number of important advantages:

1. Wages can be stabilized.
2. Direct labor costs are reduced without cutting wages.
3. Production is speeded up by making the wages consistent with the operative's effort.
4. A "fool-proof" registration of efficiency is obtainable.
5. Rate fixing is simplified.
6. Payroll work is simplified.
7. Production control is simplified.

Many of the wage incentives commonly used in industry are unsatisfactory because they fail to reward the operative proportionately to the exercise of his effort, skill and ability. The wage is too much dependent upon variable factors over which the operative has no control. The more the factors vary the more troublesome they are. Variable machine speed is one of the principal difficulties in this respect.

When an operative tends a group of machines, a very slight variation in speed will have more to do with his piece-work wages than will he himself, unless he is grossly negligent. This is illustrated in the occupation of a weaver. His time is largely devoted to piecing up broken ends on looms that are stopped. If he runs twenty looms, five per cent of his maximum rate is lost during the idleness of the one loom on which he is working. But the speed of the remaining nineteen looms may easily vary five percent from normal by reason of belt slippage or light load on the motor. Hence the loss of production from the idle loom on which the weaver is working may be equalled by the loss due to slow speed of the running looms. On the other hand, the machine idleness loss may be entirely offset by a higher than standard speed. The writer has known of numerous instances where a rate of so much per thousand picks had been figured on the basis of a definite loom speed and a nominal efficiency of 85 per cent, and then the weavers would be paid 15 per cent or more above their basic wage, and get this without any overtime work. Not only is such an occurrence destructive of proper incentive to start up looms as quickly as possible, but the excess wages paid cannot be made up out of savings in overhead expense.

So long as the wage is disproportionate to the effort put forth, there exists an unfairness to the operative which is costly to the mill. The unfairness of it causes the operative to demand a higher basic wage than would satisfy him if he could be protected against losses from occasional speed reductions. So much for the piece-work system generally in use.

Stabilized Wages.

A rate of so much per r.m.h. puts the matter squarely up to the operative to keep his machines running at the highest possible efficiency. This rate is so fixed that with a reasonable amount of stoppage he will earn his basic wage. Alertness to start up his machines as quickly as possible becomes the prime requisite for higher wages. Reduced machine speed cannot cause any loss in pay, neither does increased machine speed give him any advantage. The best men draw the best pay. The poorest by earning unsatisfactorily low wages naturally weed themselves out. The injustices of penalizing the operative for production losses due to causes which he cannot control are so far reduced, if not eliminated, that the worker comes to regard his own efforts with due respect and ceases to complain over his hard luck. He benefits, too, through the arrangement in which the management assumes the responsibility and consequent loss with respect to low production due to low speed.

Cost Reduction.

An everpresent problem with the manufacturer is to reduce the unit cost of machine operations without cutting wages. The solution of this problem is very much simplified by measuring machine running time continuously. The opportunities for obtaining the maximum production by proper co-ordination of machine speed with operating efficiency do not manifest themselves until reliable comparisons are made between the factors which determine the volume of production.

There is no standard at which to aim in regulating speeds until tests have been made to prove which is the one best speed among several that have been tried. In these tests it is not sufficient to know that the greatest production was obtained at a certain speed. The efficiency, too, must be compared in the several tests; otherwise the

human equation enters too largely into the unknown variables and the results are likely to be misleading.

This adjustment of operating conditions is like "tuning-in" a radio receiving set. A rough setting of the dials may bring in the station but the reception is not perfectly clarified until you have swung the dials both ways from the original setting to find the exact point at which the results are best. One of these dials might be compared with the regulation of machine speed, and the other with the efficiency of the operative. The management directly controls the speed; and indirectly, through the operative and through planning the ideal working conditions, controls the efficiency. After the proper speed has been established and the resulting efficiency is known, it becomes a simple matter to determine the proper number of machines to allot to an operative. In general, if the efficiency is 80 per cent, and the machines need no attention except when they are stopped, then five machines would be the minimum number to allot to an operative to keep him busy. For 90 per cent efficiency the minimum number of machines would be ten, and for 95 per cent twenty. If there are unavoidable causes for machine idleness other than what the operative can minimize, then it is proper to allot more machines in order to keep him busy. When machine idleness is due to repairs or to lack of material, the management is, of course, responsible; otherwise the efficiency is entirely up to the operative. Hence, the cost reduction comes as a natural consequence of paying the operative according to this efficiency. What is more, both the direct labor cost and the overhead cost per unit of product are usually reduced by this method.

Obviously, it would be just as foolish to increase any speed beyond the point of maximum productivity as it would be to pay an operative for high efficiency and then not get the production because of unnecessarily low speed. But it is still more foolish to make any experiment with speed changes so long as the operative is paid a fixed rate per unit of product. If a gain in production is to be made in this manner, practically all the benefit will accrue to the operative, for the difference in manufacturing cost will be confined to the overhead expense factor, and by no means can a change in the piece rate be recommended to compensate the mill for the speed change.

Numerous attempts in the past to reduce costs by increasing speed have met with disappointment through failure to understand the psychology of mill labor. What usually happens is that even though the speed increase be kept within reasonable limits, the piece-worker does not exert himself to earn any more than previously. Finding that it is somewhat easier to earn the same pay as before, he settles down to the pace which will give him the accustomed wage and rarely does it occur to him that he might be earning more, since he knows that there has been no change in the rate. Hence, a loss of efficiency is the result and this makes further attempts to reduce the cost all the more difficult.

Very different are the results when speeds are corrected while the operative is paid by the r.m.h. rate. In fact, he takes little or no notice of any changes in speed because his wages are entirely dependent upon the efficiency. He cannot afford to permit any unnecessary machine idleness. There is a real gain in production through the reasonable speed increase without loss of efficiency and without disturbing the basis or amount of the wages paid. The unit cost reduction is assured both in respect to the direct labor element and to the burden.

Speeding Up Production.

In tracing deficiencies of production to their causes, it is important to obtain the facts for the use of the management as quickly as possible after the difficulty arises. To rely upon complaints from the factory, as when material is not dispatched on time, is to pave the way for habitual sluggishness which all too frequently is accepted as a necessary evil.

The usual causes of this sluggishness are:

(1) Incapability of the operative.
(2) Waiting for material.
(3) Waiting for repairs.
(4) Loose belts.
(5) Departures from material standards.
(6) Poor performance of prior operations.

While a supervisor may tell you that he can "sense" these difficulties when they arise, he, nevertheless, places a great deal of dependence upon production reports to indicate the relative importance of the retarding factors and to give him a basis for comparison of operating conditions from week to week. There is, however, one great difficulty in reaching his conclusions. In following production figures without knowledge of the effective average of efficiency it is impossible to make a measureable distinction between production losses due to the operative and those due to the management. In the absence of information on this most fundamental point it is absurd to expect that the production figures would throw any light upon the extent of the losses due to any *one* of the retarding factors just enumerated.

By the co-ordination of production figures with averages of efficiency from day to day or from week to week the proper course to improve production is clearly pointed out. Loss of production without loss in efficiency indicates trouble beyond the control of the operative. A gain in efficiency without gain in production means the operative is exerting himself to overcome some newly presented difficulty and he should be assisted in every way possible to find the cure. A gain in production accompanied by a gain in efficiency is the only real evidence of all-around improvement of all the governing factors.

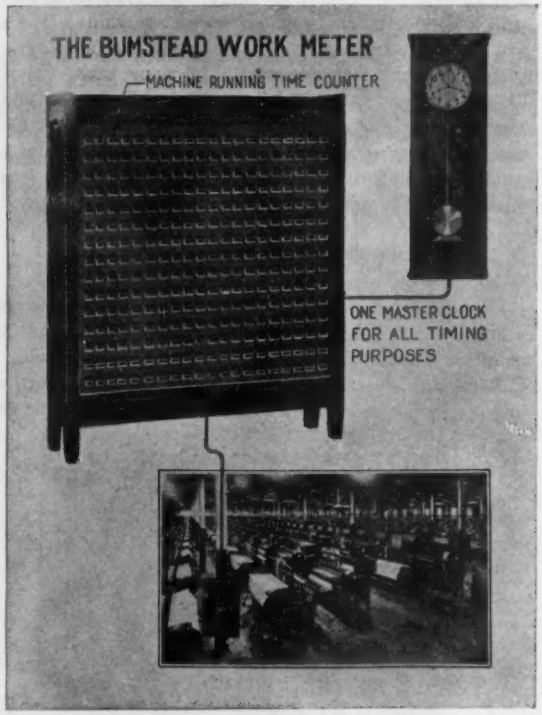
Boiling Down the Details.

In a large mill it would be burdensome to the production manager to undertake a diagnosis of figures obtained for each machine individually. Comprehensive group results are needed so that the responsible man in each case may be approached irrespective of the individual machines which may be causing the trouble. It is then up to the foreman or the operative, whichever one may be responsible.

Efficiency figures for groups of machines are more easily obtained than details for individual machines. The method recommended is to run a pair of wires from a central point selected for control purposes to each machine and by connecting the wires with suitable electrically operated counters at one end and with suitable contact devices attached to the productive machines the desired group efficiency figures are made available at all times on relatively few counting registers. The r.m.h. measurements are accurately obtained by a master-clock control of all the counting registers. One clock serves for timing the running periods of all the machinery in the plant.

Group Totals.

When a tender works on a group of machines, his competency is measured by the average machine-running time of the group and not by the performance of any one machine. Totals of the r.m.h. for groups of machines which may be simultaneously engaged for one kind of work within each group are of the utmost value to the production manager. He can then use a simple table of equivalents, based



Each loom equipped with a circuit interrupter or timer makes its own report of running time through circuits leading to a connection box (shown in the foreground of the weave-room) where the circuits are reduced to one for each weaver and one for each style. A multiple-conductor cable then transmits the results of all operations to the meter panel.

on experience, for converting the r.m.h. into any desired units of production, such as hanks, yards or pounds of yarn or cloth of a specified number or style.

How the Running Time is Tabulated.

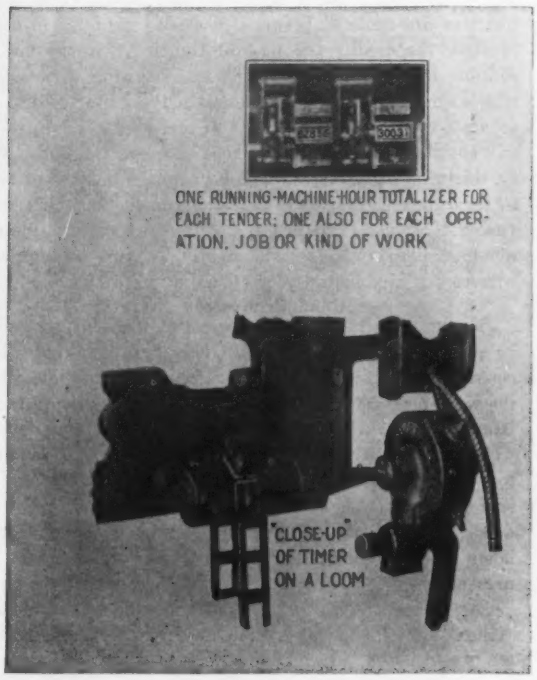
A telegraphic report of machine performance is available at all times for use both in production control and for payroll purposes. The tabulation is two-fold, one set of accumulating registers showing a classification of results by operatives, and the other set by operations, kinds or styles of product. By means of a simple connection panel, centrally located in each work room, the pairs of wires leading to the individual machines are hooked up to the control circuits for each accumulating register so that any desired grouping of the machines may be properly tabulated. Changes in the classification and grouping may be made at a moment's notice.

The actuation of the counters is dependent upon the running of the machines and the accuracy of the r.m.h. measurement is dependent upon the master-clock.

The master-clock control is entirely separate from the machine control so as to make the system "fool-proof." The operative can derive no benefit from any attempt to make the counter register more than the actual number of r.m.h. He can think of only three ways that might be attempted to accomplish so dishonest a purpose. If he breaks the wires at any point, all registrations of r.m.h. from the machines affected will cease. If he short-circuits the wires of any pair, the contact device with which the pair is connected will cease to function and no registration will result. If the wires are repeatedly tapped together, it is remotely possible that while doing so three minutes of machine running time might be registered in excess of the actual for one machine, but this possibility is limited to just half a second in any period of three minutes. Hence it would require more effort and attention to "beat" the registration than it would to keep the machines running properly.

Simplified Rate Fixing.

Within a group of machines tended by one operative it may be necessary to run several variations of work simultaneously. Under the usual piece-rate system it is often necessary to establish a multiplicity of rates in order to maintain consistency. If, for instance, the weaving of fabrics is paid for by the pound, each variation in width, picks per inch and yards per pound necessitates a different


ONE RUNNING-MACHINE-HOUR TOTALIZER FOR EACH TENDER; ONE ALSO FOR EACH OPERATION, JOB OR KIND OF WORK
"CLOSE-UP" OF TIMER ON A LOOM

Changes of connections between the counters and the timers to agree with new assignments are instantly accomplished as in making a telephone connection.

piece-rate. Seldom, however, is it necessary to consider more than four or five variations in the basis of efficiency to which the standard wage should apply. In making rates, therefore, on the r.m.h. basis, the standardization of the efficiency factor is the sole consideration. One rate per r.m.h applies equally well to all styles for which one efficiency basis is proper. This eliminates all temptation to produce goods which are not in conformity with standards of weight or other characteristics in order to gain more earnings at the expense of quality.

The r.m.h. rates are fixed with a greater degree of fair-

ness and satisfaction to the operative than is possible with ordinary piece-rates. Certain classes of work require frequent changes in the setting or gearing of the machines in order to run them successfully. On fly-frames more or less twist is required to compensate for changes of atmospheric conditions. This has an effect upon the earnings of the operative when paid by the hank, for customarily no changes are made in the hank rates with changes of twist gears. Any such upsetting of the balance as between a wage satisfactory to the operative and a permissible direct-labor cost results either in a labor disturbance or a cost too high to meet competition.

The positive cure rests in the payment by r.m.h. rates, which, if properly fixed for one standard of output, are equally applicable to any new standard that may be found necessary or feasible.

Simplified Payroll Work.

Automatic accumulation of group totals of running machine hours constitutes a tremendous economy of clerical labor. Not only is it unnecessary to take long trips through the mill to read clocks on the individual machines but the entire results of an operative's work on all his machines are registered accurately on a single counter centrally located. This counter needs to be read only once a week. Subtractions are made as between successive readings in order to show the credits for payroll figuring. If the mill is running on two or three shifts, the throwing of a switch will make it possible to accumulate the running time on separate counters for each shift so that weekly readings are still sufficient in this case. Where an operative tends twenty, thirty or forty machines and where the number of rates to be applied is limited to variations in the basic efficiency (using the r.m.h. system), it is apparent that the needed number of payroll clerks is greatly lessened as compared with the requirements under other payroll systems.

Simplified Production Control.

No better picture of the progress of work in process can be presented to the production manager than that which classifies results according to the logical groups into which the work must be divided. In order to accomplish this satisfactorily, the Bumstead Work Meter has been devised, which not only provides r.m.h. totals on separate accumulators for each operative, but it simulatenously tabulates the same production by operations, styles of work or job orders. Herein is the opportunity for economising in clerical labor and presenting the facts in the fewest possible figures at a moment's notice.

As before stated, it is generally possible to provide convenient conversion tables based upon experience or time-study which will enable anyone to reckon the output closely enough for control purposes in terms of yards, pounds, hanks, or any other desired unit. In all cases the r.m.h. measurement furnishes the facts necessary to follow up production.

All of the advantages of measuring running-machine-hours can be obtained through the employment of this work meter system designed to meet the requirements. The need was first strongly felt and then it was met. The means were not lacking. Much of the equipment has given admirable service for other purposes. It had only to be adapted to this need by adoption. The master clock is one of the recognized standards. The contact device which is attached to the productive machinery is found on every Ford car. The counter is built by a manufacturer of world renown. Only the actuating device for this counter had to be newly designed to make the system "fool-proof." This actuating mechanism is small enough to be held in two fingers. This makes possible a compact assembly of counters so that three hundred of them can be displayed on a panel the area of which is less than a square yard.

Automatic plant supervision as herein described can be introduced according to a definite progressive program in which the results obtained at each step must justify further extensions. The first cost is on a basis competitive with that of individual counters on each machine. The advantages over individual counters would justify a greater cost but such is not necessary. In many cases, the mill has its own crew of electricians who can install the necessary wiring according to specifications. The master clock and registering equipment necessary for installation of the r.m.h. wage and production control system may be leased on a guaranteed performance basis.

Opens New Industrial Department.

The Tennessee Electric Power Company, the largest utility operating in Tennessee, according to recent announcement has opened an industrial department with R. C. Leonard in charge, for the purpose of providing northern and eastern manufacturers and executives with specific data

R. C. Leonard.

about the commercial and industrial opportunities of the state. The Tennessee Electric Power Company supplies electric service for more than 100 communities of Middle and East Tennessee and is accordingly in close touch with developments in this area.

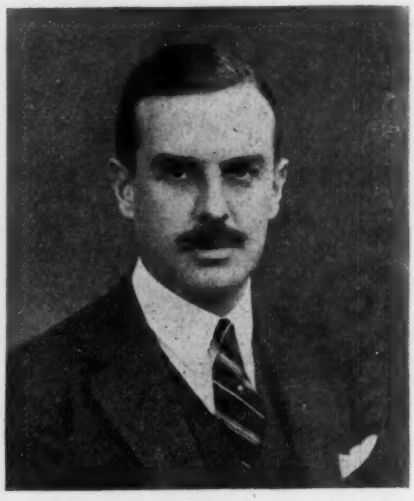
R. C. Leonard, the newly appointed industrial agent, is a native Tennessean and an engineer by profession. He has had ten years' experience in industrial plant work in Tennessee, involving practically every type of industry in the state. Headquarters of the new organization will be maintained at the general offices of the company in Chattanooga, but the industrial agent will spend a great part of his time in the North and East on which occasions he will be available for consultation with parties interested in southern plant locations.

Cotton Manufacturers Meet at Boston

Consideration of styling problems in cotton manufacture, an impressive style show, and discussion of the Cotton Textile Institute featured the 121st annual convention of the National Association of Cotton Manufacturers, held at the Copley-Plaza Hotel, Boston, Mass., on Wednesday and Thursday, October 13th and 14th.

The first session on Wednesday afternoon was devoted largely to the style question, and several experts in this field were among the speakers, including H. N. Doughty, of the Ipswich Mills; Marjorie Holligan, of the Pacific Mills; Ellen K. Doughty, of the Butterick Company; Mary Brooks Picken, of *Pictorial Review;* and Margaret Case, associate editor of *Vogue.*

Mr. Doughty outlined the steps taken by the Ipswich



President William B. MacColl.

Mills to co-ordinate their production and style service with the constantly changing demands of fashion. "To meet changing conditions," he said, "Ipswich Mills created a styling department in both the selling house and the mill, under the direction of a factory-trained executive. The styling department brings knowledge of what the buying public considers stylish as expressed by their desires and needs here and abroad, and what will be moving over the retail counter, far in advance of that brought by our customers in placing their orders. Ipswich also created a color control under the direct supervision of its assistant treasurer. The color factor in hosiery was found akin to styling. The colors are decided upon to meet the existing and future color desires of customers of retail stores throughout the world."

Like styling, Mr. Doughty said, "hosiery color is not susceptible to direct influence by any one producer, because it too is the resultant of many fashion factors; but we believe there is an intelligent method of control by the limitation of the number of colors produced, which at the same time will meet the perfectly legitimate taste for variety on the part of the well dressed women to whom Ipswich hosiery is finally retailed. It was, some years ago, apparently the belief of many distributors of hosiery that an enormous range of colors was essential to its successful sale. Believing, as we do, that a shopper is more confused than helped in the selection of hosiery of the color wanted to harmonize with her costume, by being offered a choice in a great variety of colors, many of which can only be distinguished from the next nearest shade by a careful and prolonged scrutiny, we began the study of color grouping. That is, we have gradually evolved certain master colors, designated as tones, and group all of the shades in that color together."

The activities of the Pacific Mills in meeting the style problem were related by their style adviser, Miss Holligan. The recently established style bureau of these mills, she said, "is charged with keeping in touch with style tendencies and with securing designs that fit in with these tendencies. All designs are brought under the direction of the style director, Goodell Hill, or ordered by him from our designing department, and are classified and filed with the style bureau so that the type of design can be found at a moment's notice, if we have it in the house.

"From this designing end, the style bureau functions in two ways. When we get a new idea we secure designs that exemplify it and then we either file them in some layout that we are getting up at the time or we take them to one of the sales executives who will sometimes happen to have a cloth on hand to which this idea is exactly suited.

"For the big seasonal layouts, we get the cooperation of

Secretary Russell T. Fisher.

the sales executives, who let us know the approximate date at which they will want to style certain lines, and we then get up tentative layouts, from which the executive can, in a very brief time, style his entire line when the time comes. In this way the man who is responsible for selling the goods gets from the Style Bureau a well-rounded view of their conception of the mode for each number in his line, and if there is any point that he feels they have not covered, that deficiency can immediately be made up.

"The next step in the style program naturally rests with the advertising department, with which our style bureau

cooperates very closely.

"The public is only just beginning to hear about the fashion possibilities of cotton goods when properly styled and attractively presented. We are very enthusiastic about the serious efforts towards greater style efficiency that today's affairs represent. Confining the models to costumes made from paper patterns puts our style efforts on a practical level that will appeal to the big mass of women who buy their yard goods and their patterns at the same time, in the department stores, and who are vitally concerned with combining the two into garments that will make them feel smartly dressed."

Miss Doughty of the Butterick Company declared that manufacturers can aid themselves by improving their knowledge of the purposes for which their fabrics are to be worn, and for having a definite purpose for every design and fabric. As to possibilities for cotton, she pointed out that "nothing can take the place of cotton. Women buy cotton fabrics because they know they will wash satisfactorily and because they are wonderfully attractive. In warm weather, women, especially in this country, like clothes that can be put in the tub without fussing with the temperature of the water, special soaps, etc.

"The present form of textile advertising showing made-up garments or posters and promoting the sale of materials in department stores by showing the made-up garments on living models proved helpful in carrying the piece goods departments through a very trying period. We believe that the celanese novelties, the higher grade rayons, the fine cottons, madras, dimity, fine embroidered effects and so forth will prove most popular during the coming year if presented in the proper way for their proper purpose." Textile manufacturers, Miss Doughty said, make a mistake when they try to raise the class of garment for which a material is used.

Misses Picken and Case both spoke of the possibilities of furthering the use of cotton goods by an intelligent, up-to-date consideration and attention on the part of the manufacturers as to the current needs of fashion changes.

The style show was held on Wednesday evening, and proved a stellar attraction, presenting models wearing costumes made and designed by leading New England mills.

The Cotton-Textile Institute was discussed at the Thursday morning session, at which Russell H. Leonard presided. Robert Amory and Ward Thoron outlined the Institute, which was discussed in various phases by other members.

Mr. Amory first gave a general outline of the purposes of the Institute. Mr. Thoron told of what had been accomplished to date in attracting members, declaring that out of a possible 28,000,000 spindles, some 20,150,156 spindles were signed up. He declared that in his opinion the print cloth and sheeting end of the industry needed first attention, and expressed regret that Fall River had not responded to the Institute, as other sections and centers had, especially since this city produces such an enormous proportion of these fabrics.

The afternoon session was featured by an open forum discussion, which has been re-introduced into the association's programs and which is proving to be a popular feature, as has been attested by the increasing attention and interest since they were resumed.

Melvin T. Copeland, of Harvard University, outlined the compilation of his recent book, "The Distribution of Textiles," and discussed the ailments of the industry which that study had revealed. Long draft spinning, advertising, rayon, and other general subjects were taken up in the forum discussion.

At the business meeting on Wednesday afternoon, William B. MacColl, treasurer of the Lorraine Manufacturing Co., Pawtucket, R. I., was re-elected president. Russell H. Leonard and John A. Sweetser were named vice-presidents. W. Irving Bullard is treasurer and Russell T. Fisher is secretary. Ward Thoron, treasurer of the Merrimack Mfg. Co., Lowell, Mass., was elected as the association's representative on the National Council of American Cotton Manufacturers, and was also awarded the association medal for distinguished service to the industry during the year.

The concluding session of the convention consisted of the banquet which was held on Thursday evening. One feature was the address of President MacColl. Regarding the Cotton-Textile Institute, Mr. MacColl spoke enthusiastically, saying in part:

"One of the greatest constructive movements ever attempted by the cotton textile industry has been transformed from merely an idea to a reality. I refer to the Cotton-Textile Institute. Unbelievable interest and enthusiasm have been aroused. The scheme, originating as it did in the South, spread with rapidity to the North and met with general approval. The first organization meeting was held in New York last June and was attended by one of the most representative groups of manufacturers ever assembled in the history of the industry. Especially impressive was the spirit which actuated the gathering. I believe that those present fully realized the importance of the task before them. The firm belief that the industry was in the throes of a situation that was no longer sectional but national, and that corrective measures of a drastic nature must be immediately suggested, aroused these leaders to the necessity of forming an organization that would eventually relieve the situation and bring about greater stability. As I have stated, the task was not an easy one. With some two thousand cotton textile plants in the country, extending from the extreme North to the far Southland, the problem of unifying and bringing together these industrial plants required much study and perseverance. Without going into further detail, the first steps were accomplished and today almost 20,000,000 spindles out of a possible 30,000,000 spindles have signed the three-year participation agreement. Of this number about 9,300,000 spindles are from the North and the balance from the South. It is to be regretted that a larger percentage from New England has not as yet seen fit to join the Institute. It is to be hoped, however, that as soon as the sincerity and importance of the movement are realized and it is understood that no attempt will be made to dictate to or interfere with plant operation, those who at present are remaining on the outside will join and give their support to the Institute.

"The next step in the formation of the Cotton-Textile Institute is the task of defining its work and arranging for actual operation. This calls for clear distinction between conditions detrimental to efficient production and distribution and the development of corrective measures capable of minimizing or eliminating the conditions disclosed as detrimental. Logically, the Institute's primary consideration, as I see it, is to analyze and define the factors, conditions and practices which result in over-production or unprofitable sales.

"At present, manufacturers with only a limited knowledge of their market demands and practically no knowledge of the relation of their industry's output to consumption, cannot accurately determine what corrective measures should be taken. The Institute, with its ability to gather complete and accurate information covering the scope of the entire industry and the requirements of the whole consumer market, should be able to determine with exactness the causes of over-production and to suggest practical corrective methods.

"The possibilities of the Institute are almost unlimited. It is essential that, upon completion of the permanent organization, a man of marked ability be found to serve as president. This office is not an easy one to fill and the greatest care should be taken in making a proper selection. It will require a man of peculiar qualities and one who will merit the confidence of the industry. He should be a man of recognized organizing ability with a keen grasp of economics and statistics and the faculty of getting results. One of his important problems will be to bring about cooperation between groups manufacturing similar lines of products; to point out how cutthroat competition can be avoided by controlled production and prices, strictly, of course, within the limits of existing laws. The advisability of recommending consolidations of mills manufacturing similar products is also within his range and is worthy of serious consideration.

"Possibly one of the most common causes for cutthroat competition is the woeful lack in the use of adequate cost-finding systems. I have become more and more convinced, in following market quotations on fabrics, that there are many manufacturers who do not apparently know what their costs are and accept business at the best prices they can obtain, or undersell with the hope that by some chance they will show a profit when the books are balanced at the end of the year. They are like a man I once heard of who, when asked how his business was, replied, it is in the pink of condition. He as right, as attested by the pink figures in his annual statement.

"Whatever assistance the Textile Institute may be able to render to the manufacturing industry, those in the North must continue to realize the inequality of wages and hours of labor between the North and the South. On many lines of merchandise it will require the closest attention to the economies of manufacture if we are to run our plants at capacity and on a profitable basis."

Discussing general conditions, Mr. MacColl continued, "We are again experiencing an upset cotton market, due to recent Government reports indicating a larger crop than was generally expected. This sudden drop has probably brought cotton below the cost of production. It would seem doubtful if cotton will recede to any extent below present figures. If such is the case, there is every reason to believe that buyers will realize the situation and place volume business on the current basis. This should result in a period of capacity production for some time to come. I would emphasize the danger of over-production during this period, as the result will merely be a repetition of oversupply and consequent lowering of prices. Let us avoid this situation and profit by our past experience.

"The industry has watched with interest the development of rayon—originally known as artificial silk. Many were dubious of its permanency, but it has so generally established itself that it must now be accepted as an important member of the textile family. The use of rayon has been so rapidly developed that the public has not been informed as to its proper handling. In some cases, too, inferior merchandise has been produced, which has temporarily affected its popularity. There is, and always will be, a great deal of rayon used, but a broader policy of education as to its proper handling and washing should be promptly inaugurated by the manufacturers of this product if it is to continue its popularity.

"In concluding, I would refer to the changed merchandising methods in force. For years the industry was content with selling its products through the regular channels of the wholesalers. There has recently been a marked tendency toward more direct distribution to the consumer. Whether this is to be a permanent condition, time will tell. The passing of many nationally known jobbers has been noted. The recent announcement that Claflin's of New York is to liquidate further emphasizes this trend. We have seen notable successful examples of direct selling to the consumer in other industries—particularly in automobiles, shoes, etc. To what extent is direct selling applicable to our industry?

"The future of the wholesaler in this country is one of vital interest, at the present time, to the distributors of cotton piece goods. In this connection, it is interesting to examine briefly statistics showing channels of distribution for 1925. From reliable sources, we are informed that there are approximately 374 selling units marketing cotton piece goods, valued at approximately $1,694,000,000, of which about $550,000,000 (or 32¾ per cent) of the total mill output in 1925 was purchased by wholesalers of cotton and dry goods, to be resold to the retail trade. 27 per cent, valued at $464,000,000, was purchased by cutters. 19 per cent, valued at $326,000,000, by converters; 10½ per cent, valued at $175,000,000 abroad, or by tire manufacturers; 6½ per cent, valued at $107,000,000 direct to retailers or other trades; 2½ per cent, valued at $36,000,000, to mail order concerns and the balance of 2 per cent, valued at $30,000,000, to chain store systems. This large amount —totaling, as I have said, $1,694,000,000, represented the product of 874 cotton cloth mills and was sold through 374 primary distributors—and bear in mind that 32¾ per cent of this vast amount was handled by wholesalers. These figures are mentioned to show the immense distribution still sold through wholesalers and to emphasize the importance of this factor to the industry. I hope that the Cotton-Textile Institute will present figures of this character from time to time, to show the trend in the future as to our channels of distribution."

James R. MacColl, president of the Lorraine Mfg. Company, Edwin Farnham Greene, president, Lockwood, Greene & Co., Franklin W. Hobbs, president of the National Association of Wool Manufacturers, and Maj. Gen. John F. O'Ryan, president of the Colonial Air Transport, Inc., were other banquet speakers.

The V. D. Anderson Co., Cleveland, Ohio, manufacturers of steam and air traps and other steam specialties, have just added a new model to their line of steam traps. This is the No. "O" Junior. It has ¾" inlet and outlet so that it fills a need for a trap larger than the half inch Junior, but smaller than the half inch Model "D". This new trap has a capacity of 1000 lbs. of condensation per hour and is adaptable to all pressures up to 150 pounds.

Scientific Trends with a Textile Slant

If we say that any region is the potential future home of an industry, there is a meaning to that which goes deeper than the mere fact that the tendency is in that direction.

No one has ever been able to thwart the natural trend of a situation over a very long period of time—the attempt even is disastrous to oneself. Far safer, is it, to observe the nature of a trend and align plans to it.

A potential future is built about subtle elements of the imagination, the desire and the spirit, but these are also based upon tangible facts which can be seen and set down here for profitable study. This is the nature of things which are safe bases upon which to build an industrial venture.

A certain mill had a large number of company-owned houses. These were not only comfortably built, but *each* was built upon a distinctive design, not "cut off by the yard."

Yet it was apparent to the owner, concerned with the housing of his people, that certain missing features in the construction might be naturally and logically desired by the people. A study of the matter revealed that a small convenience of the interior furnishings was in almost unanimous demand. Made in quantity, this furniture was not excessively expensive. The enthusiastic reception it had at the hands of the people proved the demand, but it did more. A purely voluntary act, it forged one more link in the chain which welds owner and worker together in that community. It provided insurance so that neither the canker of unrest could corrupt the relations nor could the spirit of the professional organizer break through and steal their hearts.

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One of the machinery companies heard that an out-of-the-way mill had "a specially constructed" machine in the spinning department. This was said to be giving unusual results. So the machinery concern sent its engineer down to observe the new machine and get data.

What was his surprise to find that the phenomenon was one of *his own machines* improved and changed as a result of the interest of the mill's technical organization. The machine man got enough "real dope" about what that process demanded to turn out a much better machine and without much delay.

Look, then, at what one *interested* organization did for the section in which they were situated. Not only did they put their own plant one stride in advance of the whole industry, but they drew cooperation from the maker of a vital process machine and convinced that machinery firm of the *necessity* of active all-the-time cooperation in their territory—and this helped every mill nearby.

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One of our boys, in a bleachery, excused himself very early in the evening when we dropped in on him, recently. He remarked to the effect that being on the job at 6:15 made early sleep a necessity. Further, that five days of it made a full week, but that "beginning about 5:50 in the afternoon, on Friday, we step some."

They work hard. The plant shows it. They play hard. It is reflected in their keenness and aliveness on the job.

This is a pretty hard combination to beat in building both men and an industry. (Don't try to build one without the other.) How stupid "organized play" stacks up against this plan.

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It is interesting how a much better *place to live in* results from spontaneous social life. This is particularly noticeable where people who work hard preserve the urge for the contacts and graces which interesting events afford.

When an essentially industrial community's young men have the initiative to form an active "stepping" cotillion club and keep it alive and growing it is, indeed, an indication that our growing industrial area is capable of expansion upon hopeful lines.

Clean cut alertness is developed in such activities—the mind socially alert is also active in the commercial sense. Such men as this bring an extra something, an effective nonchalance to the job. For in no other place as in industry is it quite so evident that we are divided into two great classes—"the quick and the dead."

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We sometimes get more constructive ideas from men newly entered in the industry than from the rest (this is capitalizing upon their critical spirit).

One of the prime needs in new industrial expansion is the development of the mill-engineering sense. We older ones at the game have handled mill problems so long that we have forgotten, perhaps, that the "mill sense" developed within us is what we call upon to solve a tough problem.

The way in which this is trained in was illustrated the other day by one of our newly "arrived" engineers. He pointed out he had done so many plant layouts, now, that he could tell, at a glance, when even one machine was rightly adapted to the job. He arrived at *skill in generalities* by *faithfulness to one detail*, and then the *next one*.

So also is the way of all talent applied to building up our community of interests.

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"We made a mistake in the 'cheap labor' immigration policy we demanded (and got) 15 or 20 years ago. What looked to be a means of profit to us then has become one of our greatest sources of uncertainty and loss. Do you think that *you* will be able to keep your section free from the same thing we have had? If you do you have success ahead—it is one of our gravest concerns here."

This reads like the confession of a Senator to his constituents, but instead these are the exact words of the operating manager of a nationally famous industry, located in an apparently prosperous and impregnable center of that industry.

What a world of information this gives us of experience under the old plan; what a warning to us who are still socially intact.

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Permanence—the soul of stability in business and industry is the objective which we seek by all our planning and all our science. The two outstanding characteristics by which we recognize the permanence of a business institution are its power, which we feel, and the glory of its achievements.

Yet power and glory are arrived at only through adherence to principles, which, carefully examined and tested, have proven their soundness. Certain of these principles, economic, technical and social are the rocks in the foundation of the temple.

The power we recognize in an industry is its reliability as a source of progressive ideas; the glory, its clean and ever increasing contribution to the social and artistic betterment of the life and enjoyment of the nation. These two make the house "founded upon a rock."

Carding-Spinning Discussed by Eastern N. C. Division at Rocky Mount

A meeting which resulted in considerable interesting discussion on carding and spinning was held at Rocky Mount, N. C., on Friday, October 1st, by the Eastern North Carolina Division of the Southern Textile Association. This body was formed early in the summer, holding its first meeting in Goldsboro in May, to fill a need for a separate discussion division devoted to subjects particularly of interest to the soft-yarn spinning mills which comprise the majority of plants in that section of the state. The second meeting in October was held in the community building of the Rocky Mount Mills, with Hyman L. Battle, manager of the mills, as host.

Clovis M. Black, superintendent of the Borden Manufacturing Company, Goldsboro, N. C., who is chairman of the division, presided at the meeting. Since the Goldsboro meeting had considered spinning largely, he explained, this gathering would emphasize the card room processes. After a few preliminaries, Mr. Black opened the meeting for round-table discussion. He announced that a questionnaire had been prepared by two of the members covering the entire mill, and that certain questions relating to the carding department had been selected to form the basis of the discussion.

The first question raised by Mr. Black, in starting the discussion, was, "Where is the most productive place for bad work on the card?"

Answering this, George F. Brietz, superintendent, Selma Cotton Mills, Selma, N. C., said that "there are a number of places on the card that will make bad work. One of them is in the stripping; by just immediately after stripping, piecing up and going ahead. We have a practice to let it run on the floor a little while to get the dust and lint out of it. Another thing of course is improper settings. You can get them too far away or too close. I mention these two thoughts just to break the ice."

D. W. Knight, superintendent, Rocky Mount Mills, said next that "I think that after you strip if you would wait until you strip about two cards before you piece the end up it will help a whole lot. We try to do that; keeping the card strips out has a whole lot to do with the keeping it in good shape."

Following this line of thought, Mr. Black said, "in stripping, whether by roll or vacuum system, how long should a card run after it has been stripped before the cylinder and doffer get full up to where you can get the sliver you are supposed to produce? We have not been doing what these men suggest. We have had quite a bit of uneven work, and we have traced some of it back to not letting the doffers fill up. I think that is a good idea."

Getting back to the original question, G. N. Gurley, overseer of carding, Rosemary Manufacturing Co., Rosemary, N. C., declared that "there are so many places you can make bad work on a card, but one thing is split laps, which I think make a large percentage of the bad work. As regards stripping, I think after one card is stripped it should run until you strip the next cylinder."

"Then you think that stripping one card is ample enough time?" asked the chairman.

"Yes sir," answered Mr. Gurley. "We have more bad work from split laps than any other one thing."

T. W. Mullen, superintendent, Rosemary Manufacturing Co., explained to the soft-yarn spinners that in a weaving mill "we do not have people cussing us about uneven work. In a yarn mill making sale yarns it is quite a proposition, but in a weaving mill we do not follow up on the length of time before starting a card after stripping; as long as the work is good running work in the weave room we do not have any kicks about the cloth."

M. R. Vick, another overseer of carding at the Rosemary mill, added that, "regarding bad work on a card, I consider that if a man lets his licker-in run down he can get the worst work there. So far as stripping is concerned, in a weave mill I agree that one card is enough to wait, but in a spinning mill I should strip every other card around and then go back. You will find very little variation if you do this, because you will have a variation in the sliver anyway."

Mr. Shipp said that "we strip out and then put up every other card, and I agree about that licker-in business. The greatest trouble in the card room is letting the licker-in go down."

While the licker-in was being discussed, Mr. Black took another question from further down in his list: "Do you try to sharpen lickers-in locally; if so, how?"

In response to this question, it seemed to be the unanimous practice that with licker-in shops so convenient to the mills as at the present time, it was unwise to try to grind lickers-in at the mills, but on the other hand much better to send them to the shops for re-winding. D. F. Lanier, superintendent, Oxford Cotton Mills, Oxford, N. C., explained a sand box he had used for this purpose, but with the shops so handy, he has not used this in more than a year. Furthermore, he pointed out, if there are high and low places on the licker-in surface, the sand-box is ineffective.

"I have tried sharpening them," said Mr. Vann, "but there is nothing to it. When it gets dull the point is dull and when you sharpen it, that point is low."

The next question brought up by the chairman was, "If you had to increase the card production ten per cent, where is the best place to do it, keeping in mind the quality of the work?"

"In that case I would increase the speed of the doffer," responded Mr. Vick. "I believe in light, quick carding. I do not believe in a slow doffer speed, especially with a low grade of cotton. If you are running the doffer slow you are keeping the cotton in the card too long, and, I believe, the quicker you get it out the better off you are."

"But suppose you were running a 27-inch doffer at 16 turns a minute, and you still have to keep it up or resort to the production gear, what would you do?" asked Mr. Lanier.

"On a 27-inch doffer he should not speed up from that; he is getting enough," was Mr. Vick's reply.

"But supposing you had to?"

"Oh, well," said Mr. Vick, "you ought to get some more cards and put them in."

"I think for a 27-inch doffer, 15 turns is a plenty," added Mr. Vann. "You are making bad work over that. The bands must be kept too tight. I would heavy up on it."

"While we are on this subject, we will take up another one of our questions," said Mr. Black. "Is short draft better for light or heavy carding?"

"Here has been my experience," said Mr. Vick. "Not so very long ago my lappers were running short and I had to keep my production up, and I increased my drafts from 90 to 110, and made my laps heavier, and the work didn't run any worse, and I believe really that I rather like the long draft on a card."

Mr. Black agreed that he prefers the long draft. "The quicker you can get the cotton out the better off you are," he believes.

"Speaking of long and short drafts," said J. S. Hailey, overseer of carding, Caswell Cotton Mills, Kinston, N. C., "I have always found a long draft better. Of course, when you get your lap up heavy enough, the setting has something to do with it."

In answer to a show of hands on the long versus short draft question—considering 90 short and 110 long—all of those voting preferred the long draft, there being no hand raised in favor of the shorter draft.

The next question was, "Do you find compressed cotton harder on the cards than local stock?"

"That depends on the condition the cotton is in when it reaches the card," answered Mr. Vann. "If you have the proper opening equipment, I do not think it makes any difference. We have the vertical opener and Murray cleaner, and with that I think it is just about as easy on the card as the local cotton. It should not increase the strippings any if you have the proper opening machinery."

Mr. Gurley said that he weighs his strippings and makes them come to a certain percentage on the compressed cotton. "We have a very good opening arrangement, and we do not find it any harder on the cards. However, if I did not have that opening arrangement, and I could get a Kirschner beater in the breaker picker it would help out on the card, but with a plain beater there and no opening arrangement it would make more work for the card.

"I think that a Kirschner beater in the breaker does more good than on the finisher," he continued. "On the breaker it helps to open the cotton so the plain beaters can get to it. I think it would pay to put in a carding beater in the breaker."

"It is true," observed Mr. Black, "that in recent years more and more mills are opening their eyes as to the necessity for the proper opening equipment. Now, for instance, suppose we find out what you think would comprise an up-to-date opening arrangement for 7/8-inch cotton. Suppose you tell us what you have now, giving us the equipment up through the finishers."

"We have two vertical openers and a horizontal cleaner hooked up in tandem," responded Mr. Lanier, "with three processes of picking—a double beater in the breaker. We found when we put in the horizontal cleaner, using the three processes of picking, that the breaking strength went off, so we took out the intermediate picker and the breaking strength immediately went back up to a little bit better than what it was before. Our arrangement, I think, puts the cotton in first class shape, and our cards have given better results, carding as heavy as we have to, especially on the compressed cotton."

"We do not have as much opening as some of you men," reported Mr. Mullen. "We have one vertical opener and one horizontal cleaner, and three processes in the picker room, with one beater in each machine. We have been running the horizontal only about five weeks. We believe that on our general run of cotton, Strict Good Middling, that we get enough cleaning." He said he figures that he gets out about .3 per cent on the horizontal cleaner.

Mr. Black said he noticed that the horizontal cleaner saves the waste around the pickers, decreasing the fly. Mr. Garner said he did not see how it reduces the clearer fly at all. H. M. Culbreth, overseer of spinning at the Borden mill, said he had noticed that the clearer waste is much less.

Norman B. Hill, superintendent, Caswell Cotton Mills, Kinston, N. C., asked, "When Mr. Lanier took out the intermediate, if he had reduced the speed on the beater wouldn't it have done as well as taking it out? What speed did he run?"

"We were running 1,150 r.p.m., and reduced it to 1.000 r.p.m.," answered Mr. Lanier. "That was on the finisher, and the others were reduced in proportion, and I took out one process of beating."

Mr. Hill asked about the amount of trash taken out.

"The motes from the pickers decreased 15 or 16 per cent, after putting in the horizontal cleaner, but we believe that machine got more than that," answered Mr. Lanier.

"I would like to ask Mr. Mullen how much stock he puts through the vertical and horizontal cleaners?" requested G. E. Moore, assistant superintendent, Edenton Cotton Mills, Edenton, N. C.

"About 55,000 pounds in a week of 55 hours," was the reply.

Mr. Black said he would like to have some discussion here regarding the Kirschner or carding beater versus the plain blade beater in the finisher picker. He has never been able to tell any diffrence, he said; somtimes when he put the blade in he wished he had the carding beater in, and vice varsa.

"If you will put the carding beater in the breaker I believe you will be satisfied with it," declared Mr. Vick.

"Can you maintain the same speed that you had before?" asked Mr. Brietz.

"That is a matter of experiment. I would try it and then cut down, if necessary."

"I asked, thinking that the same speed might damage the work," explained Mr. Brietz. "I certainly am going to try it out."

"What difference is there in setting the feed roll?" asked Mr. Black.

"I set it the same," said Mr. Vick. "About the thickness of a rule; the same as the blade beater.

"Do you maintain the same settings on the cards on compressed cotton?"

"Yes, sir, we did not make any changes whatever."

Mr. Black next asked for practices as to card settings carding 750 pounds a week of 60 hours, or 125 pounds a day.

"I set the doffer to the cylinder to 7/1000," answered Mr. Vann, "and I don't mean a tight or loose 7; I mean to a 7. Comb to doffer, 12/1000; flats, both front and back, 9/1000; licker-in, 10/1000; feed plate, 12/1000. This is based on Middling, one-inch cotton."

"How much difference do you make in the setting of the screen under the cylinder, back and front?" asked Mr. Black.

"The back is set to a full 34/1000 gauge, and at the front I use my judgment."

Mr. Hailey reported the following settings: Doffer to cylinder, 8/1000; comb, 19/1000; flats, 11/1000 and 9/1000; licker-in to cylinder, 8/1000; feed plate, 12/1000; mote knives, 11/1000.

The chairman announced here that in a questionnaire later to be sent to the members, detailed information with reference to settings and other practices on the different machines would be requested. He had already compiled the answers for his mill, and stated that he would read them to the meeting, and asked for any criticisms or suggestions which any of the men might be able to make.

He is running a 50-inch cylinder, 27-inch doffer, with 100 wire on the cylinder and 110 wire on the doffer, running ⅞ to 1-inch cotton, he said in answer to questions on these points. "What wire would you recommend?" he asked the meeting.

"How much are you carding a day?" asked Mr. Vick, and Mr. Black answered, "About 103 pounds."

"Then your wire is all right," declared Mr. Vick.

Continuing, Mr. Black said he uses 110 wire on the flats, the same as the doffer, has an hourly production per card of about 10 pounds, and makes a 50-grain sliver, using a 94.6 draft on the card.

The speed of his cylinder is 165 r.p.m.; doffer, 10½ r.p.m.; licker-in, 415 r.p.m.

Right here, A. B. Deans, assistant secretary-treasurer, Wilson Cotton Mills, Wilson, N. C., requested some discussion on licker-in speeds, from anyone who had experimented with high and low speeds. This question developed the fact that A. B. McAlister, overseer of carding, Roanoke Mills Company, Roanoke Rapids, is using a licker-in speed of 375 r.p.m. In response to questioning, he stated he had arrived at this speed as satisfactory following tests ranging all the way from 300 to 550 r.p.m. The 300 r.p.m. speed, he said, did not take out enough, while the speed of 550 r.p.m. took out too much waste and good cotton under the mote knives.

Returning to his own practice, Mr. Black read his answers to the question on card settings, as follows: Screen under licker-in, back, 17/1000; center, 34/1000; front, 3/16-inch: mote knives, top, 10/1000; bottom, 7/1000: feed plate, 12/1000; back plate, 34/1000: feed plate, 12/1000: top flats, front, 10/1000; center, 11/1000; back, 11/1000. His carding, he explained, is on the second floor over motors driving the spinning frames below, which resulted in vibration making this flat setting necessary, he explained. His stripper plate is set so as to make a 20-grain strip, he added.

Mr. McAlister said he cards about 110 pounds a day, and makes about an 18-grain strip.

The next question asked by Mr. Black was, "State some of the defects in the finished product caused by bad carding."

"The worst thing I know of is uneven work on the drawing frames," said Mr. McAlister. "It will tear the spinner up before you know what you are doing."

"Then, if you found uneven yarn, the first thing you would do would be to go to the drawing frame?" inquired Mr. Black.

"Yes, sir."

"Then when you got there, what would be the first thing you would look for?" asked the chairman.

"That depends. It might be the calender roll stretching it. The draft might not be right. The rolls might not be set right for the length of the cotton. And you must adjust the calender roll gears according to the weather." This was Mr. McAlister's answer.

"Speaking of uneven work from the drawing frame," observed Mr. Hailey, "the worst trouble I ever had, on H. & B. frames, was getting the proper weights on each end of the roll. I found that sometimes we would have 14 pounds on one end and 50 or 75 pounds on the other end. It is always a job to keep the adjusting screws adjusted so as to have them even. They have a beam to raise the weights for unhooking and I took them off because they were so jammed together that it was almost impossible to get the same tension on each end of the roll. I found that was the biggest improvement I had ever made.

"Of course the calender roll gear gives a lot of trouble; and another thing, you can let the roll in the can get so close from the calender it will give you trouble."

With the change of the weather, Mr. Brietz brought out, it is a difficult matter to keep the tension on the strands uniform, and he wanted to know which was to be preferred, a tight tension or a sagging one.

One man said that he preferred to have it slack, and Mr. Black added that that had been his experience and that he would rather have a little sag there. "My observation is that you can get more even work with a little sag," he explained.

"Another thing," observed Mr. Hailey, "is the trumpets; if they are not of the same size you cannot get the proper tension on the sliver, and if you have your trumpets the proper size you can get the correct sag on the sliver. Another thing, if the shoulder of the roll gets worn, you cannot get a tension. I have taken a hammer and swelled the ends—I know that is not the proper thing to do but I was trying to correct the difficulty in the best manner available.

"We watch the drawing frames very closely," said Mr. Vick. "Whenever we find an end beginning to slacken, we try to find out what is the matter with that end. We have five-end drawing, and if one end slackens, the whole drawing is not wrong, so we try to find out what makes that end sag. A dry back roll or a dry bottom roll, or a little piece of waste in between the bearing of the steel roll and the end where it fits in will cause uneven work. It is mighty hard to get the help to look after these things; the overseer must do it himself.

"Another thing, I try to get my slubber hands to look out for cut roving coming off the bobbin, they can tell it and if they watch it they can save a lot of trouble, and most of my men can tell it very well.

"Another thing, if your drawing frames are located

underneath the spinning room you are liable to have trouble with little travelers coming through from there; regardless of how good a floor you have, they will get through, and you know how much trouble they can cause; so you should watch out for that all of the time."

This concluded the discussion on this question, and the next one was asked by Mr. Lanier: "Has anybody tried changing the train of gears from 8 pitch to 10 pitch? We have considerable trouble with ends running slack at some times and tight at others. We have been working over the rolls, and we are forced sometimes to change the change gear, but we have been thinking of changing the train of gears from 8 pitch to 10 pitch, and if anybody has done this, I would like to know about it."

"We have done that and it works fine," replied Mr. McAlister. "It is better than the 8 pitch, and it takes all of the noise out of it and makes it run quieter."

"Does the quality of the carding affect the breaking strength of the yarn?" was the next question presented by the chairman.

"I don't believe anyone would argue that point at all," declared Mr. Mullen.

It was explained that the intent of this question was that if a mill was using a Western cotton, and ran out, finding it necessary to change to a local cotton, what remedy would be suggested, and would it be advisable to set up on the card, if it was known that this cotton would be used for quite a while?

"Well," said Mr. Vick, "it would be an easy matter to set up one card while grinding, and try it out and watch it through the spinning room to see if it would make any difference."

"I was just sitting here wondering," said Mr. Brietz, "whether humidifiers were worth more in the winter time than the summer time."

Mr. Vick said that he uses his all the time.

Mr. Mullen pointed out that it depended upon the kind of a heating system used by a mill. In his case, he said the humidifiers were better in the summer time because during the winter season his hot air system takes care of part of it. On the other hand, Mr. Black stated that his humidifiers were better in the winter time because he has steam pipes on the ceiling and a lot of static electricity in the winter time.

"I have steam pipes in my room and I find that we need the humidifiers more in the winter time on account of having the steam in the pipes overhead," said Mr. Vann. Mr. Knight expressed the same experience.

At this point there was some discussion as to the proper amount of relative humidity to carry in the card room and the concensus of opinion which coincides with recommendations of experts was between 50 and 55 is correct. Mr. Black added that he tried to carry a little bit more around the speeders than he has around the cards.

"If you are running it above a certain point, it will retain the specks in the yarn," said Mr. Battle. "This summer we had our himidifiers overhauled and rearranged and got more relative humidity in the card room than we needed with the result that we had specky yarn."

"How far can you go without holding them in?" asked Mr. Black.

"I believe over 60 per cent will give you trouble," replied Mr. Battle.

Here the chairman brought up the question of using the humidifiers in the picker room, pointing out this had been discussed pro and con at several other meetings. He advanced the argument that damp cotton is harder to clean than dry cotton, and also raised the question of the tremendous amount of air passing through a picker room requiring an inordinate amount of humidification.

L. R. Gilbert, vice president of the Southern Textile Association and until recently superintendent of the Caraleigh Mills Company at Raleigh, declared that he was in favor of using humidifiers in the picker room where raw stock dyed cotton is used. He pointed out it is a question of whether it is desired to replace the natural content of moisture in the cotton. Later he pointed out that the term "relative humidity" does not mean anything, "you must figure the grains per cubic foot of air to know where you stand at any time. Of course the hotter a cubic foot of air the more water you have. In the summer time you have a great deal more natural humidity in the air than in the winter. Therefore, you need the humidifiers for that reason and for static electricity in the winter time."

Mr. Brietz raised the point here as to whether it would be more difficult to control the humidity in a mill located on a stream than in a mill in the dry highlands.

Mr. Mullen brought out that in the famous yarn manufacturing center of New Bedford, Mass., that location was selected in the days of no artificial humidification because of the natural humidity in the air on the sea coast. However, he imagines, it would be more difficult to control the humidity in a mill located near water.

"I had an experience some years ago in a mill located in a river valley," said Mr. Vann. "When I went there, I found humidifiers in the card room but I could not run them. I remember one day the superintendent came thorugh and said, 'George, why aren't you running the humidifiers?' I told him I couldn't do it. He insisted, however, because they had cost a lot of money and he wanted to get his money's worth out of them. I turned them on and after a while I saw the superintendent coming from the east side of the mill stopping off every frame as he came along, and when he got to me he wanted to know what in the world was the matter and I told him it was the the humidifiers and he told me to shut them off, and I did not run them again as long as I was there."

Mr. Black next brought up the matter of running card strips back into the regular mixing of cotton, by asking the question, "Does anyone rework the card strips; if so, how?"

J. W. Thompson, of the Oxford Cotton Mill, answered that he runs his card strips back, explaining, "I run them through the vertical opener and mix them with the drawing waste and other waste picker, and feed them into the pipe beyond the horizontal cleaner, and this waste goes back into the regular work." He stated that he makes 7s, 8s, 9s, 10s and 12s.

Mr. Battle said that he used to rework his card strips into his 16s yarn, using about one-third strips, "and we had the reputation up North of making about the sorriest 16s made in the South. I stopped using these strips and since then we have been able to sell our 16s. Now we put back only our roving waste."

"Well, Mr. Thompson, if you use them over and over then you do not have any card strips for sale?" queried Mr. Black.

In answer to this Mr. Lanier, superintendent of Mr.

Thompson's mill, caused considerable laughter by stating that they finally got rid of their card strips by "sweeping them up in the spinning room."

Mr. Vann related another one of his experiences here, this time of being overseer at a mill where the president and suprintendent kept a record himself of the cloth when card strips were reworked and without card strips, stating that this man told him that he could not tell any difference and that they ran them back. This, he said later, was on a 27-inch print cloth.

"It depends on the class of yarn being made," said Mr. Vick. "In yarn for the wire covering trade you can use the strips back all right, but when it comes to yarn that is going into woven goods, I do not think it pays to use the strips."

"There is one thing about it," said Mr. Battle, "with cotton selling today at around 13 cents, and strips bringing 9 cents, it seems to me that a man would do much better to sell his strips and buy new cotton." With reference to what Mr. Vick said about the ultimate use of the yarn, Mr. Battle pointed out that he does not always know just what his stuff is going into, and even if he did he could not keep any part of it separated in the mill for this purpose.

In further comment on Mr. Vick's statement, Mr. Deans said, "we have had a lot of business with the wire covering trade and we have found them to be the most particular people in the trade."

The chairman next asked for opinions as to what percentage of strippings should be taken out, carding 750 pounds a week. Mr. Vick said that he tries to take out about 3 per cent. Mr. McAlister said he gets out about 2½ per cent and the chairman reported from 2½ to 2¾ per cent.

At this point Mr. Battle told of an experience he had recently had in increasing the breaking strength of his ply yarn. He said that he went over to visit his friend, Pat Deans, at Wilson, and found that his yarn was breaking a good deal better in the ply yarn than his own, "and we went to work on the travelers on the twisters, and by lightening them up we increased the breaking strength a good deal."

In describing what was done, Mr. Knight, who is superintendent of Mr. Battle's mill, stated, "Mr. Battle tested some of Mr. Deans' 20s in the single yarn and the breaking strength was around 80 pounds, warp. Our 20s broke around 85 to 90 pounds in the single yarn. But on the ply yarn theirs broke much better than ours and sized just about on the number, so we got to work on the travelers and by putting on a traveler that was two or three grains lighter we put our breaking strength up about four or five pounds."

"Has anyone had a similar experience on spinning," inquired Mr. Hill, "using a traveler too heavy so that the breaking strength would not be as high as it would be with a lighter traveler?"

"I think as light a traveler as you can run the better, without having them so light that you get a fuzzy yarn," declared Mr. Knight.

"We have made some tests on that," reported Mr. Lanier. "We tried to run Draper speed—and you know what that is—and we had considerable trouble with the coarse counts not breaking up to standard. We tried shortening the draft but that did not help much with the same speed but we could reduce the speed down to the Whitin table with the same draft and increase the breaking strength, and we could run a lighter traveler."

"There is no doubt but that a reasonable traveler will give you results," declared Mr. Moore. "If it is too heavy it will stretch the yarn, and if it is too light it will wear itself out."

"The traveler is undoubtedly one of the most important things in the mill, and is also one of the most neglected; very little attention is paid to it," said Mr. Black. "It can cause as much trouble as the drawing frame, and I do not know of anything that can tear up an operative quicker."

"What effect would a worn ring and humidity have on the traveler?" asked Mr. Vick.

"If the ring is worn too badly, the traveler will not stay on, and if it is worn a whole lot it will cut it out faster," replied Mr. Moore.

Mr. Vick brought up the question here of the advisability of changing the rings all at one time, when they become worn.

Chairman Black endorsed this method strongly, stating that just as he buys an entire equipment of tires for his automobile, so does he replace a full set of rings on the frame at a time. "I have tried the plan of ordering a few rings at a time, and the first thing I knew I didn't know where we were," he said.

"My experience has been to change the whole business at one time," added Mr. Hill, "and I then do away with all of the old rings, because whenever you change some, you have two or three different tensions on the yarn, because you must use the same travelers."

L. E. Taylor, of Charlotte, stated that the ring traveler concern with which he is connected found that a number of mills do pursue the practice of changing a few rings at a time. He said, however, that Mr. Hill was right, because if a ring had been used for a number of years, the traveler has made a kind of a runway in it. Yet, he said, changing a whole set of rings is an expensive proposition, and many mills do not do it, and that the traveler concerns must meet their demands. He reported that they had found usually a lighter traveler with a different circle was necessary—usually a larger circle.

"I would like to bear the gentleman out," said C. C. Cates, of the Edenton Cotton Mills. "We are running 8s three- and four-ply, using card strips, and we have had a good deal of trouble with our twister travelers jumping off, and we had a special circle made, using the same number, and find it helped a whole lot."

"Can you get a higher speed with a smaller or larger circle traveler?" asked Mr. Allen.

In answering this, Mr. Taylor first said he wanted to agree with Mr. Black as to the lack of attention paid to and the importance of the traveler. He declared that after investigation and experimentation, they had come to the conclusion that "the measuring stick of progress in spinning is the ring traveler." Taking up the question of Mr. Allen, Mr. Taylor used the illustration of two No. 7 travelers, one with a 2 circle and the other with a 3 circle. Both of these, he pointed out, must weigh the same. However, he said, the 3 circle traveler must cover a greater amount of space, while the 2 circle is more compact, and "I would say that the traveler with the smaller circle would stand more speed under the proper conditions."

Here Mr. Brietz related a recent experience of changing

the weight and width of cloth, finding to his surprise that the weight of the cloth remained the same in spite of the fact that it was an inch wider. In the meantime, he said, they had set up the cards closer. This puzzled him for a while and he finally found the mystery solved by the fact that the wrappings on the section beams were smaller.

Mr. Black reported trouble here on one of his breaker pickers, in the cotton on the screen being thicker in the middle than on the sides. It was suggested that either there is a lump in the beater box killing the draft, or else the fan might be broken.

"What about cork-covered rolls?" asked Mr. Mullen. "Mr. Black, I believe you said something about them at the last meeting."

Mr. Black reported that careful tests had shown no appreciable increase in breaking strength with the cork rolls, over the leather rolls, but that a benefit in the way of the cost of roll covering was noticeable.

"We have been having trouble occasionally with weak places showing up in the yarn, without making any changes whatever," said Mr. Lanier, asking for any suggestions.

"I would suggest that you watch the drawing frames for cut drawing," said Mr. Vick.

"I wouldn't be surprised if you are right," Mr. Lanier declared.

A discussion of the Cook-Taylor banding device followed the suggestion that his trouble might be coming from uneven tension on his spinning frame bands. Mr. Battle, who has this device in operation, explained it, stating that it is satisfactory as it gives an even tension on all of the bands.

"Speaking of bands, said Mr. Moore, "I would like to know if anybody has changed their ideas as to the number of bands to the pound. If a spindle was running properly at the right speed twenty years, will the same kind of band keep that spindle up to speed? Should we increase the size of the band because the whirl is worn?"

"I might say in answer to that, that when I went to Goldsboro I found the whirls worn, and I increased the size of the bands 1/16th inch to take care of it," said Mr. Black. "We make them up out of intermediate roving."

"Will a band made out of roving wear the whirl like a yarn band?" queried Mr. Vick.

"I should not imagine that a roving band would wear it as much as a band made out of yarn," said Mr. Black.

This concluded the discussion, and the morning session was adjourned. Promptly at one o'clock, a sumptuous barbecue was served the visitors by Mr. Battle, following which a short business session was held. Upon invitation of Mr. Mullen, the division voted to hold the next meeting in Roanoke Rapids in the Spring of 1927. Chairman Black appointed several committees, and short talks were made by L. R. Gilbert, vice-president of the Southern Textile Association, J. M. Gregg, secretary-treasurer of the Southern Textile Association and The Arkwrights, Inc., and Robert W. Philip, associate editor of COTTON, following which adjournment was taken with thanks to Mr. Battle and the Rocky Mount Mills for their courtesy and hospitality.

Warp Sizing

BY PAUL SEYDEL.

Slasher Room Equipment.

In Europe, size kettles or vats are made of wood or copper fitted with either direct or indirect steam supply, also with stirring devices. Some are provided with cold and hot water supplies. The hot water is useful when it is desired to fill up a kettle or to dilute the size, which should preferably not be diluted with cold water as this affects the colloidal properties of starch very unfavorably. The cold water is used to mix the starch preparatory to boiling.

When no provision is made to dilute the size with hot water and only cold water is available, this should be poured in very gradually in order not to chill the size any more than can be helped, as size once chilled is bound to be inferior size.

While pouring in the cold water, steam should be turned on and the size boiled and stirred as vigorously as possible to minimize the harm done by diluting the size. The reason why Europeans prefer wood or copper vessels is due to fear of rust, which does not seem to worry Americans so much, as most of the size kettles in this country are made of steel. With proper care, rust can be avoided.

The use of soda will obviate the danger of rust. When the kettle is idle a weak solution of soda will prevent rust. This should be carefully rinsed out and the kettle itself always kept scrupulously clean before using.

The kettle mostly used in this country is built of iron to hold between one and two hundred gallons of finished size. It is fitted with direct steam heating fittings and an efficient stirring device often with paddles operating in opposite directions to increase stirring efficiency, which is quite important. The lower paddle should nearly scrape the bottom to avoid sediment forming in the bottom of the kettle. The kettle should also be fitted with cold and hot water supply. The hot water may be obtained with a steam siphon into the cold water pipe.

One very essential need to insure evenness of results is that size kettles, storage kettles, circulating systems and pipes be covered with asbestos to minimize radiation of heat and condensation of steam and to preserve the high temperature at which the size should be applied.

Another essential point is to use the same size kettles with some type of agitator and speed of agitation throughout the size room as the length of time it takes to cook a mix depends on the agitation.

From the kettle the size should be run into the size box of the slasher through a fine mesh screen to eliminate the possibility of lumps, sticks, and other insoluble foreign matter contaminating the warp.

Many slashers are equipped with a size circulating system which is useful mainly to maintain a constant level in the slasher box and tends towards more even results.

Many types of slashers are in existence, but the type greatest in use has a copper cylinder drier revolving either by direct motion or on roller bearings and the warp covers the greatest part of the cylinder over which it passes. Sometimes two or more cylinders are used, the object being that the second and third cylinders not being surrounded by a damp atmosphere will dry more efficiently. This can

also be greatly helped by fast revolving fans. The cylinder drier is efficient and fast. Its main objection is that it bakes the warp and flattens it so that it loses its cylindrical shape and is rather tape like.

The temperature on the cylnider is much higher than that required in the air drier. Temperatures on drum driers vary from 212 degrees to 260 degrees Fahrenheit and often more. High temperatures have a tendency to tender the warp, to make it brittle and harsh, to cause shedding and breakage and to cause the warp to tie badly. A number of air drying sizing machines are on the market. In some of them the warm air for drying the sized yarn is furnished by radiators at the bottom of the drying chamber. In others, the warm air is produced in a steam chest where it acquires a temperature of 120 degrees to 140 degrees Fahrenheit. The temperature is very low compared to that of the drum driers. The warm air travels in the drying chamber in a direction opposite to that of the warp, it is both forced in by a suitable fan and expelled by an exhaust fan. The warp travels on skeleton drums or guide rollers through a number of compartments. The rollers may be provided with ribs to prevent the yarn from touching the whole surface of the roller and in this way to offer more drying surface to the air circulating in an opposite direction. The rollers should revolve on ball bearings to minimize tension and to avoid stretching. There are openings to the drying chambers located in convenient places to reach the yarn when desired.

Very compact machines are built with maximum drying effect and minimum consumption of steam. The current of air has a tendency to drive the loose fibers all in the same direction, the advantage of which can readily be realized. This type of drier produces a very good warp with greater elasticity due to drying at lower temperature than does the drum drier. Roller bearings are very important especially when there is no positive drive, and a positive drive is essential when the set is light, otherwise the stretching of the warp will considerably increase its tendency to break. Running the fans of the slasher very fast will help dry the warp so as to make it possible to reduce both the pressure and the temperature of the slasher drum, which of course is very desirable.

It is good practice to calibrate section beams to obviate the possibility of building the warp on these beams cone or angle shape, this having the tendency to cause selvage on looms to break more readily than it would with a warp uniformly built on the beam, due to uneven tension of selvage warps.

Special attention should be paid to the setting of the immersion roll. If one end is lower than the other, the yarn will stretch so that when reaching the loom beam it will produce a set of warps with considerable more breakage on one side than on the other of the beam.

One of the most important adjustments on the slasher is the matter of tension on the yarn. Slack yarn gives bad results on the loom and even kinky twist and breaks on the lease rods. Too slack yarn will slip on the drums and does not dry evenly. On the other hand, too tight a yarn is still worse, as it stretches and takes all the give out of the warp before it gets to the loom. This whole question of tension is one that requires great skill and attention on the part of the operative.

The usual custom now in practice is to cause a rope to pass over a groove in the beam head of the back section beam or perhaps one or two beams in the set. The end of the rope is weighted and the friction reduces the momentum of the beam when the slasher is stopped. The yarn from this beam passing over and around the beams in front of it acts as a check on them. This of course puts a greater strain on the back beam, or beams. A device has of recent years come on the market to automatically control the tensions on the section beams and to do this separately for each beam, thereby equalizing the strain on the warp of the several beams. This device, invented by W. W. Arnold, now agent of the Brookside Cotton Mills, consists of a frame support made of angle iron to carry the tension device. This frame runs along the creels the length of the slasher and just outside of the section beam supports. It is about five feet high. At intervals spaced accordingly with the section beam on this frame are bearings to hold the tension device. The device itself works on the principle that the tighter the yarn gets, the less friction is required on the beam head, and when the sheet of yarn slackens, more friction is required to get a uniform tension. This is made use of by means of a tension assembly for each section beam which is mounted on angle iron frame supports directly over the section beam. This assembly is composed of a ball bearing guide roller, the shaft of which carries on each end a lever which actuates the rope tensions. The levers are fulcrumed near the ends where the rope tensions are fastened and on the opposite end of the levers a floating roller is mounted, which floats on the sheet of yarn as it is delivered from the section beam. If the sheet of yarn becomes too tight it raises the floating roller which in turn releases the friction on the beam head, thus decreasing the tension on the sheet of yarn. When the tension on the sheet of yarn becomes too slack, the floating roller following the yarn down gradually increases the friction on the beam head, raising the floating roller until the proper tension on the yarn is obtained. The levers, which are actuated by the floating roller, will work independently of each other, thus allowing the floating roller to float out of a horizontal plane, and in this way maintain a uniform tension on an individual sheet of yarn, where the yarn is not wound on section beams in a uniform diameter the full width of the beam. Thus the sheets of yarn from each of the section beams are delivered to the size box under the same tension, causing all of the section beams to run out at the same time, greatly reducing the amount of waste made on the end of each set. This waste is reduced from forty to sixty per cent, as compared with the old method of creeling. The uniform tension of the yarn wound onto the loom beams greatly reduce warp breakage on the looms.

The proper equipment of the slasher room is as important as the proper selection of sizing materials. A poor sizing equipment may multiply the value of the most scientifically compounded size, and a perfect equipment with the use of a scientific sizing formula will surprisingly increase production and improve it beyond belief.

An Oversight.

Editor's Note. On page 1077 of the September number of COTTON we printed an illustration of a measuring and knocking off motion for looms. In connection with this illustration we should have stated that this illustration is copyrighted by Robert Hall & Sons, Bury, Ltd., Bury, Eng.

The Importance of Knowledge of Economics

By LUTHER H. HODGES and HARRIET L. HERRING

The article below is one of a series which has to do with the fundamentals of business, or, more properly known as Industrial Economics. These articles are being published from month to month. Each one is a unit in itself, although forming an integral part of the entire series.

Practical mill men like practical material and these articles are designed to meet the needs of textile operating executives of the South who are interested in knowing more about the laws governing business and industry. The entire series has already been used by a large cotton mill organization in the South in its educational work, and this organization found the material to be very practical and effective.

Each article lends itself to discussion by groups of mill men, as well as being helpful and interesting reading. Naturally the articles are brief and in attempting to cover this large field, only the most important points have been considered.

Economics may mean one thing to one person and have an entirely different meaning to another individual. To the student or professor it is an interesting social science, while to some practical business men it is a lot of theory and bunk. Until very recently the study of Economics was confined to college class rooms and research libraries. It dealt with business but business did not deal with it. Scores of books were written on the subject and thousands of lectures were delivered by professors to students, which students promptly forgot the lectures. Book after book that came from the press was criticized by business men because the language was too technical for the average man to grasp.

An Awakened Interest.

During the past few years there has been an awakened interest in the whole study of Economics and the fundamentals of business. Suggestive of this interest that has been manifested by business and industrial leaders are the various Economic Services and Bureaus that have sprung up to aid and furnish information to business leaders. Prominent among these Services and Bureaus are the Babson Institute, Inc., and the Harvard Economic Research Bureau, Inc. The patronage given these organizations shows the interest of practical men in the so-called theoretical science of business. The fact that the Harvard Bureau successfully forecasted and explained the great depression of 1920 proved to hard headed business men that there was something to this thing called Economics. This interest has not been confined to the presidents and board chairmen of the larger corporations, but the executives, large and small, have evidenced an interest. Minor executives, like foremen and other key men have decided that there is something in it for them. They are trying to relate these economic laws to their business and to themselves as individuals.

The Reason for This Interest.

This interest has doubtless been accentuated by the recent World War which so thoroughly upset everything. However, there are more normal reasons to account for much of the recent interest in this study. The increase in population and the greater complexity of business in general has drawn society closer together and made us all more dependent on each other. Under primitive conditions, the people were largely self-supporting and economically independent. Such organizations as they possessed were chiefly for attack or defense in war. The people supplied their own personal wants by their own labor or that of their households. Actual manufacturing was done in the home and it is quite interesting to note that the textile industry, though highly specialized, is still very closely tied up with the primitive methods. In many localities, even now, textile manufacturing is done in the home.

As civilization has advanced from the simple relationships of long ago, the industrial and business practices have changed. As the population has increased, human wants and human differences have increased. Through desire in some cases and through necessity in others, men began to devote themselves to specialized tasks and to exchange specialized products one with another. The problems and complexities which are so evident today in our business and industrial world grew out of their continual specialization and exchange of products.

Definitions of Economics.

To get the most out of the very important subject, it is necessary to get the right approach to it. Let's study the various definitions given herewith.

1. Economics is a specialized study of business in its social aspect. (In this case, the word "business" is used in its broadest sense to cover all lawful ways of making a living.) (Clay).

2. Economics is the scientific study of the activities of men in the process of getting a living. (It is primarily interested in the manner in which men endeavor to satisfy their material wants.) ("Outlines.")

3. Economics is the fundamental science of business and of social life. (Roberts.)

Continuing Mr. Roberts' definition—It is the science of business and considers that body of facts, principles, theories and data that has to do with the production, distribution and consumption of goods.

Based on Facts.

Economics is based on facts gathered from many sources. Often these facts are gathered together and studied, certain conclusions are reached and economic laws are announced. But even after these conclusions are reached, it does not mean that Economics is necessarily always definite and accurate. It must have enough facts to draw its conclusions, but these conclusions, unfortunately perhaps, are not permanently applicable. Just this past summer the treasurer of a firm that keeps a daily bank balance of $1,000,000 told the writer that the conditions prevailing in the textile industry at that time were absolutely inexplainable. He said that the firm which he represented had used all their economic knowledge but it had not explained the conditions or met the situation for them. The only conclusion we can draw from the experience of this treasurer is that the body of economic facts was not enough. Facts are cumulative and it takes many facts and much experience to make up the mass of economic theory.

Economics Does Not Take Sides.

Economics does not take sides. It is not prejudiced. It does not attempt to say "What ought to be"; it tries to tell "What is" and gives the reason why. If a slump in textiles is the question at hand, Economics gives the facts and explains them, but it does not criticize.

It has often been said that most of the Economic texts

were written from a prejudiced viewpoint; namely, that of Capital and capitalistic interests. This criticism has come mainly from Labor, through its trade union officials. They have argued for books on Economics written from the standpoint of Labor. But that wouldn't be right either. It should be written from an unbiased and unprejudiced standpoint. Economic interpretation should be made from the standpoint of truth only and not in favor of a group.

Economics Represents Viewpoint of Society.

It is interesting to note that the private or individual point of view is necessarily somewhat selfish and narrow. On the other hand Economics represents the broader viewpoint of society, of all the people. Economics is impersonal and impartial. It is social in its interpretations. It analyzes and interprets from facts gathered from the experiences of society as a whole, and not from an individual. The principles of Economics are based on the broad viewpoint of society.

Of course we all realize that the individual has a definite place in the industrial scheme. Even though economics represent the society viewpoint, it doesn't mean that the individual is ignored. The work of society is the product of the individual. Its thinking is done by individuals and its greatest results are accomplished through the ambition and zeal of unhampered individuals. Practically every exceptional organization has some outstanding individual who has brought fame and success to the enterprise. When we think of Bethlehem steel, we think of Charles Schwab; when we think of U. S. Steel, we have in mind Judge Gary; Standard oil brings to mind Rockefeller. The great organization of Marshall Field & Company is but the lengthened shadow of that merchant prince, Marshall Field. However, the individual, despite his power and influence, cannot live unto himself alone. He is a part of society and should live and work in it.

Business, the Fundamental Basis of Society.

What is the object of business? Its object now, and always is to supply the wants of the people. Business or industry is the fundamental basis of society; with it society progresses or recedes. Industrial development and business success, therefore, are necessary conditions of social progress. This is more easily and clearly understood if we consider any average textile community. Because of a depression in the textile industry every textile community is affected. All trade people, doctors, lawyers, and even preachers are thoroughly and painfully dependent. Further than that, because of strained credit and unfortunate economic stringency, friendships are often tested to the breaking point—honesty, truthfulness and personal friendships are seriously impaired and affected. Industry has held to its objective of supplying the wants of the people. Although industry has grown, it has the same objective. It is seeing a further object and that is to give society what it wants and give it with relatively less effort and with more efficiency. Through greater industrial efficiency, it is reaching this goal.

Our Responsibility.

Finally, we want to urge a sincere interest in this important subject. We want to learn more about economic laws and more about industrial organization. Business must serve and we as business men must get results. We can produce—we can get results more effectively and intelligently if we are informed. It has been said that "the really valuable citizen and leader is he who understands our social and economic system, and is qualified to guide public opinion along the way of steady, permanent advancement." We give below a statement by Wallace B. Donham, Dean of Harvard Graduate School of Business Administration, who states most clearly the responsibility we have as executives in this world of changing conditions:

"No amount of theory can be a substitute for energy, enthusiasm, initiative, creative ability, and personality, nor will it take the place of technical knowledge. Now, however, all of these personal qualifications may be coupled with an adequate technical equipment, and yet the executive of wide experience may fail *through inability to grasp broad underlying forces controlling business*, a knowledge of which would give a sound basis for judgment."

Questions.

1. If business is so practical, why is the science of business (Economics) made up of theories?
2. Does a person directly benefit from a knowledge of Economics? Does he lose from a lack of this knowledge? Explain.
3. In your own words, what has caused the renewed interest in Economics?
4. How does the workings of economic laws affect (if at all) you personally, your job? Give examples.
5. What are the five most important questions of the day? How many directly or indirectly involve economic matters? Discuss.
6. Name some laws passed by your Legislature that have economic consequences.
7. Consider the economic phases of the recently proposed Federal Child Labor Amendment. How would this amendment affect the textile industry?

Sir Alfred Mond, chairman of the board of the Mond Nickel Co., Ltd., London, Brunner, Mond & Co., London, Victoria Syndicate, Ltd., of Canada, Henry Wiggins & Co., London, and the Amalgamated Anthracite Company, Swansea, South Wales, has returned to England, after a month's visit in the United States and Canada. During this trip, Sir Alfred, accompanied by Robert, Emile and Philip Mond, also of the Mond Nickel Co., visited the company's ore properties in the Sudbury area of Ontario, the smelter at Coniston, Ont., and the recently formed subsidiary for the United States, the American Nickel Corporation, Clearfield, Pa.

The subsidiary company, using Mond nickel, produced under the process developed by Dr. Ludwig Mond about 1900, is entering into the manufacture of nickel products, including rods, bars, sheets, tubes, wire and castings of 99 per cent pure nickel as well as 70 per cent and other alloys. Among the more highly manufactured products of the company are pure nickel condenser tubes and turbine blades and a line of domestic utensils for use in large institutions as well as the average household. Sir Alfred points out that while cooking equipment of pure nickel has been in use in European countries for many years, its use in the United States has been limited. It is also intended to manufacture large, pure nickel equipment for use in the pasteurization of milk and for similar purposes.

In addition to his connection with various British companies, Sir Alfred Mond has been a member of Parliament for the past 20 years and was Minister of Public Works, and later Minister of Health in the coalition cabinet during the war.

The Texas Textile Association

BY ROBERT W. PHILIP.

An interesting discussion on technical problems, which took a course that showed genuine progress in the organization, and an enjoyable gathering, featured the twenty-third semi-annual meeting of the Texas Textile Association, which was held in Fort Worth on Friday and Saturday, October 15th and 16th. There was a good attendance, and the Worth Mills and D. D. Towers, their agent, acting as hosts, provided a splendid program for the visitors.

The meeting was opened officially at 2:00 o'clock on Friday afternoon with the registration of delegates at the Hotel Westbrook, following which the visitors were carried for a tour of the city, ending with an inspection of the Worth Mills, one of the newer Texas cotton mills.

The First Session.

At 7:00 o'clock Friday night, the first session of the meeting was held, beginning with a banquet provided by the Worth Mills at the Hotel Westbrook, with Agent Towers as toastmaster. Rudy Copeland, vice-president and general manager of the Worth Mills, welcomed the visitors in a happy vein; and following his remarks of welcome spoke briefly with reference to the prospects and possibilities of the textile industry in Texas, declaring that the state, because of natural and economic conditions, has a bright future along this line.

Commenting upon the Worth Mills, Mr. Copeland paid a tribute to the operatives employed there, outlining how, when the mill was being built, the greatest efforts were made to secure workers representing the highest type of citizens and coming from good homes. The type of operatives employed at the Worth Mills—particularly those of the female persuasion—had attracted the attention of *certain* of those who had visited the plant in the afternoon; and these Gentlemen Who Prefer Blondes—having, however, no aversion to brunettes—endorsed Mr. Copeland's opinion that Mr. Towers had previously acted as casting director for Ziegfeld's Follies.

C. S. Tatum, superintendent of the Bonham Division of the Consolidated Textile Corporation, Bonham, Texas, responded appropriately to Mr. Copeland's welcome. The next speaker called upon by Mr. Towers was Hugh S. Clarke, superintendent, Miller Cotton Mills, Waco, Texas, who discussed the attitudes which the superintendent should take toward his help. A spirit of friendliness and association without loss of dignity, kindness and consideration, and a brotherly interest, were the main points which he stressed as being essential to the proper handling of help. Mr. Clarke was followed by Rev. Hawkes of Fort Worth, who discussed the matter of getting religion into business. Mr. McCauley, of C. R. Miller Mfg. Co., Fort Worth, talked of Texas' textile future.

J. G. Coman, superintendent, Mexia Textile Mills, Mexia, Texas assumed charge of the meeting at this point as president of the Association, and opened the practical discussion on the basis of several questions which had been assigned different members for tests before the meeting.

While this method is truly a step forward in the operation of the discussion features at the meetings, and although several did bring the results of tests, it should be stated here frankly that much more value would have been derived had the other men, who failed to attend or report their findings, contributed their part.

Figures on Loom Stoppage.

The first assignment was, "Take ten looms on eight-ounce duck and record the number of stops and the cause of each over a period of ten hours."

Mr. Tatum was one of those reporting. "We made that test at Bonham," he said, "but we found after we started in on it that a test run for ten hours would not be worth very much because one of the tests run one day for ten hours showed a wide variation on the next day, so we ran it for seventy hours—seven days of ten hours each."

One reason he went into this matter so thoroughly, he said was because he wanted to compare the relative merits of the regular hand-knotter with the weaver's knotter, as he was particularly anxious to know whether the weaver's knotter was really any improvement. He read the following report on the regular hand-knotter: "We ran two days of ten hours each on duck looms, and we found an average of 18 gouts, 5 spooler knots, four kinks with knots, six stops from weak yarn, twelve stop-offs, three slam-offs, seven stops from loose strings, or a total average of 59 stops from the eight looms, or 7.3 stops per day."

On the weaver's knotter, he said, "we found in a five-day test, 12 gouts, six spooler knots, four kinks with knots, two kinks without knots, two from weak yarn, fourteen stop-offs, three with strings, and five slam-offs, or an average of six stops per loom per day. You will note that the spooler knots on the latter six, and with the old knotter five; however, the kinks with knots were four in each case."

Reading the total stops from day to day, he showed these to be 48, 71, 51, 39, 48, 46, 55, etc., "so you see if you pick out any one day it will be misleading."

Mr. Booth also made a report, but because of an unusual situation, including the fact that he has a number of new loom-fixers at the present time, and also that the figures were not compiled as he desired, he asked that no report be made of his figures.

J. V. Hunt, overseer of weaving, Brazos Valley Cotton Mills, West, Texas, observed here that he had found that when a test is made on a loom, or anywhere else, if those operating the machines know that another test is going to be made later on, there will be a difference in the operation and working of the machine when the next test is made. Mr. Coman agreed with him, declaring "that is a a great advantage of a test of this kind; it stimulates a man to do a lot better work."

With regard to the weaver's knotter, Mr. Coman declared he adopted this as standard equipment at Mexia, and that it is entirely satisfactory. He said he experiences no trouble with the spooler hands losing production or with the knotters. He has had them in since the first day of July, he said, "and our expense on upkeep has been 69 cents; in fact we have not put on any new parts." His yarn numbers are 9.6s and 12.5s, making a standard eight-ounce duck. He said he had also used the knotter on 7s yarn.

"I would like to make one observation," said Mr. Tatum.

"As Mr. Hunt brought out, we made discoveries, too. We found certain looms were stoppong a great deal more than others. The way we carried out the tests was to hire a special weaver to do this work and nothing else. I believe if a test is worth making it is worth careful attention..

One of the things we learned was that one-third of our stoppage was caused from gouts. We investigated this and found that when we put our duck on filling wind some time ago, that the overseer had to open up his guides, and it would not catch the gouts, and of course we got that straightened out right away. I feel that one thing fully repaid me for all of the expense we had. I would recommend it to every mill to make these tests regularly. We are going to keep them up. As Mr. Hunt suggested, our loom fixers got busy, and the second time we found a marked improvement on these certain looms."

Loss in Calendering.

"How much loss is there in brushing and calendering eight-ounce duck? Is it practical to arrange the steam calendering so there will be no loss in the process?" This was the next question upon which the chairman asked for reports. A. L. Whetstone, superintendent, Dallas Textile Mills, Dallas, said they had made a similar test previously, and asked the night superintendent, Ingram Lee, to report on this test.

"We ran a test on 3.25 drill, 14½s and 15s yarn," said Mr. Lee. "Our test covered the processes from the slasher through the calender and brushing operations, but the figures might be of interest. We first ran a test on the slasher, weighing up the section beams and the yarn we took off, and figured the percentage of size. Then we put a warp on the loom, and weighed the filling, and carried the cloth on and weighed it, and figured how much the cloth lost, and knowing the weight of the unsized yarn, we figured that it was 1.11 per cent loss. We put on 11½ per cent of size. Most of the size lost was beat off on the loom where you have the roughest treatment of the cloth."

"We ran several tests during my absence from the mill," reported Dan H. Poole, superintendent, Sherman Mfg. Company, Sherman, Texas. "The first test was made on ten bales with a total weight of 4,682 pounds. That was before calendering just as the cloth came from the loom. After it passed through the calender and folder it weighed 4,567 pounds, a total loss of 115 pounds, or 11½ pounds per bale or about .72 pound per cut. That was on the hot roll calender with 35 pounds steam pressure.

"The next test was on a cold-roll calender. On one bale, the figures show that it weighed 470 pounds before it was run through, and 465 pounds after, or a loss of five pounds. Then we made one with ten pounds steam pressure on the roll, and before the bale weighed 465 pounds, and afterward 460 pounds, or a loss of five pounds.

"The loss on the cold test and with ten pounds pressure was five pounds loss in each case, while with the 35 pounds pressure the loss showed 11½ pounds to the bale. While another experiment showed there was about four pounds per bale regain on the first test of ten bales after it was run through and set aside several days; there was no regain on the cloth that was run through with only ten pounds pressure."

"What percentage of moisture did the cloth contain before you ran it through your calender?", asked Mr. Coman. Mr. Poole replied that he did not have that information.

"Was the cloth baled or un-baled when it was stored?", asked Mr. Hunt.

"It was un-baled," answered Mr. Poole. "It was just set aside in the cloth room."

W. H. Gibson, manager, Gibson Supply Company, Dallas, Texas, formerly superintendent of the Waxahachie Cotton Mills, Waxahachie, said that when he was in the mill he made these tests once a month, and he found that the loss varied from one to one and a quarter per cent.

"I have made a few tests along this line," said Mr. I. G. Moore, superintendent, South Texas Cotton Mills, Brenham, Texas, "but my tests have been different from these others in that I made them on the individual cuts. I can weigh ounces and fractions of ounces on the scales I have and I figured it on the cut basis. I have weighed the cloth before it went through the calender and then afterward, and the tests that I made showed that we lost just about one per cent."

"Do you think it is impractical to put enough steam to it to balance up the amount lost," asked the chairman.

"I have never been able to put that much in there," replied Mr. Moore.

"How much moisture do you have in the cloth room," asked Mr. Coman.

"I have no humidifiers in the cloth room; just the ordinary temperature of the air," answered Mr. Moore.

"Does the cloth regain any after it is stored away?"

"I have never made any tests on that," said Mr. Moore.

J. R. Compton, superintendent, Gonzales Cotton Mills, Gonzales, Texas, said that when he was boss weaver at Bonham they made some tests which showed there was no loss at all, but after going to Gonzales, his tests showed there was a loss of about one per cent there, and that he had been unable to do anything to maintain the regain in the finished cloth to compensate for this or to balance it.

"Just recently we made this test," said Mr. Tatum of Bonham, "but before reading you the figures I would like to say that is depends a great deal on the nature of the size, the amount of size, how the rolls are set, the amount of twist, etc.—all of these things enter into it. We found that we vary from a slight gain to a slight loss. The first test we ran showed that the cloth weighed 434½ pounds before and 433 pounds after calendering. We balanced our scales correctly, so I know our figures are right. Our second test showed 437 pounds before and 437½ when it came out. The other figures are: 421 before, 421 after; 427 before, 427½ after; 439 before, 439 after. There is practically no difference in what we got when it leaves the calender rolls. We also find that when it sits in the warehouse it shows a gain, never a loss."

"We ran two tests at our mill," said Mr. Coman, "and we found that we lost, on eight-ounce duck, about ¼ of one per cent; on ten-ounce goods we lost 1-3 of one per cent. Our cloth room is in the weave room, and we have practically the same temperature and practically the same amount of moisture as in in the weave room. We do not find that we can steam it heavy enough to balance up for that slight loss."

"We are using a low-grade stock on this work," said Mr. Tatum, and I find it takes on more size. There is not so much natural oil in it."

"I think that makes a great deal of difference, added Mr. Coman. "We find the low-grade stock will take on considerable more size."

W. F. Smith pointed out that the difference in the character of the cotton had an effect on this, and Mr. Coman added that the more twist in the yarn the less size it will take up. "We find that a very slight variation in the weight of the warps will affect the amount of size the yarn takes up. We use a twist multiple of 4.25 on 9.6s yarn, and we find that we get a good deal better breaking strength by using the low twist multiple because the size penetrates it better and binds the fibers together." This statement from Mr. Coman concluded the discussion on this question.

Steam Required in Slashing.

The next test was: "In drying a given number of pounds of warp, what is the comparative amount of condensed steam used on two-cylinder and three-cylinder slasher, the warp to be dried at the same speed in yards per minute for each test? Is there any difference in the breaking strength of the cloth made from these tests?"

"We found it took 415 gallons to dry one set of eight-ounce duck warp," reported Mr. Tatum. "The speed was 25 yards a minute, 2,100 ends in the warp. We run ten pounds steam pressure on a two-cylinder Lowell slasher."

Frank Burdine, superintendent, Itasca Cotton Mannufacturing Co., reported that on a two-cylinder slasher, it required 300 gallons to dry a set of 2½ wraps of eight-ounce duck warp, with twelve pounds steam pressure.

"We have a three-cylinder slasher," said Mr. Coman," and we run eight-ounce warp at 40 yards a minute, with seven pounds pressure on No. 3 cylinder and eight and nine on No. 1 and No. 2. Of course, the object of this was to find out if the higher steam pressure does damage to the yarn. We know that when the beams are removed from the slasher it must be stopped. Does that short period of time affect the sizing of the yarn and make it weaker in that place?"

"I think so," said Mr. Burdine.

"On a good deal of work, we sometimes run as low as two and three pounds pressure on both cylinders," said Mr. Coman, "and we think that the lower steam pressure gives us a little bit better result than we got from a two-cylinder slasher."

Mr. Gibson referred back to the figures given by Messrs. Tatum and Burdine, pointing out that the number of yards on the beam would make a difference, and in response, Mr. Tatum said his were 10,000 yards long, and Mr. Burdine reported 8,000.

"Have any of you been using a temperature regulator instead of a steam regulator on the slashers?" asked Mr. Towers, explaining that the device he had in mind controls and maintains a constant temperature by means of a thermostatic rod between the two cylinders. He pointed out that by the use of this device, changes in steam pressure, so long as the temperature remained constant, would have little effect.

Mr. Clarke here announced that on the basis of the figures given, Mr. Tatum required a gallon for every 31 yards, and Mr. Burdine a gallon for every 25 yards.

"I made the tests you refer to for breaking strength," reported H. C. McKenna, overseer of weaving and designing at the Planters & Merchants Mills, New Braunfels, Texas. "As a matter of fact, we have to stay in behind this all of the time for the sake of breaking strength. We are running potato starch, and it is a matter of life and death with us to keep the breaking strength up on our goods. We make our tests by taking four spools of yarn and putting then in the creel behind the slasher and running them over the size roll, and reel them off on a skein winder, and weigh them and break them. Then we take the same number of spools and run this yarn through the size, and weigh and break this, and compare the strengths. We try to keep between ten and eleven per cent increase in breaking strength on the slasher.

"I also get our percentage of size applied in the same way. It is much more accurate than by weighing the section beams and the warps. We run 6½ to 7½ per cent size. We run four skeins a day, and my figures show that on 2,300 ends of 30s warp, with four pounds of steam pressure, we get a breaking strength of 66½ pounds on the sized yarn, and that with ten pounds pressure we get 61½ pounds.

"In connection with that we went a little further and found that there was a variation depending on the temperature of the size and the amount of size in the box. We do not have a circulating system. We found that with the size box full, we got about 1½ to 3 pounds better break than with the size down low in the box. We use an open steam line. Running two temperatures, 160 degrees and 205 degrees, we found that we got a break of 61 with the higher temperature and 56½ with the lower."

Mr. Hunt asked Mr. Towers what provision is made with the temperature regulator on slashers when doffing. When Mr. Towers said that it automatically cuts the steam off, Mr. Hunt asked whether the yarn on the cylinders would not be dryer than the rest. Mr. Towers replied that there would be some difference, but that it would not have much effect.

Mr. McKenna added here that the figures he gave had been corrected to a two per cent stretch which he had found between the front size roll and the calender roll on his work.

The chairman asked here if anyone were using blankets on both rolls, and it seemed to be the majority of practice to use blankets on both. "We do not use a blanket on both, we use a duck on one and we think we get as good results or possibly better," said Mr. Coman.

"On gray goods we do not use the blanket on both," said Mr. Clarke, "but on indigo dyed warps we do use it."

Mr. Coman asked for experiences "with the slasher roll wound with yarn," but no one present indicated its use. "I do not see how it would make so much difference on duck," said Mr. Coman.

Steam Pressure.

"The fourth question taken up was: "What steam pressure in slasher cylinders produces the best weaving results, and how much moisture should yarn contain when it leaves the slashers?"

Mr. Whetstone said he had reduced from ten and twelve pounds to four pounds pressure on the slashers, and "we get better results and I believe we have the best running warp we have ever had."

Here the question of mildew danger with low steam pressures came up, and Mr. Tatum expressed the opinion that "the man who is always jumping on his slasher man about mildewed warps is standing in his own light." Both he and Mr. Poole expressed the opinion that it is entirely

all right to expect a mildewed warp occasionally, instead of going to the other extreme. Mr. Hunt said that he generally judges by the feel of the warp; that on osnaburgs he runs five pounds pressure and on a heavy duck warp fifteen pounds in order to get the same feel and weaving qualities.

Mr. Clarke reported success using low steam pressures. He said that on a 9½s denim warp he had been using ten pounds pressure and one day the steam got down and he ran with three pounds pressure with good results, and that he has increased the speed and shut the steam off and "we have had two mildewed warps in a month and I think that is all right."

Here a discussion of agents for the prevention of mildew arose. Mr. Coman said that copperas has been recommended for this; Mr. McKenna said he had used magnesium chloride but that he had discontinued this on request when the bleachery was installed. Mr. Tatum suggested zinc chloride and carbolic acid.

This session adjourned following some scattered discussion on various spinning points, and it was announced that the concluding session would be held on Saturday.

The Sataurday morning session was opened at 10:00 o'clock by President Coman, who introduced, for a few remarks, Miss Isabella Child, of the *Manufacturers' Record* of Baltimore.

Variation in Weights.

Resumption of the technical discussion was next, and the first test to be considered was:

"Starting with the cards, determine the percent variation in card silver, drawing, slubbing, roving and yarn made from one set of laps on the cards. Use as large a number of weighings as possible from each machine, a weighing from each spindle on one slubber, one roving frame and one spinning frame is suggested. What changes did you make to reduce the variation at each process?"

Herbert A. Burow, overseer of carding, Bonham Division, Consolidated Textile Corporation, Bonham, was first to report. "We ran that test at Bonham," he said, "starting with the laps on our cards and going up through the speeders and spinning frames, but I do not have the weight variation figures from the spinning.

"We started off with nine laps from nine different cards, every lap weighing exactly the same, and we found 31 per cent variation on the cards. On the first drawing we found 13 per cent variation and five per cent on the second drawing. Slubbers, six per cent; intermediates, seven per cent, speeders, eight per cent. These percentages were derived from a great number of weighings at each process; from every card, and every delivery of drawing, and every spindle on the frame. We have as many as a hundred weighings, which were averaged up for the percentage of variation."

Mr. Tatum pointed out that these averages included the extreme variations, as "we took every weight whether it looked like an extreme or not."

Mr. Compton reported the following figures: "We took six laps from the finisher picker and weighed them and got the percentage of variation, which was 2.4 per cent on the finisher picker. On the card it was four per cent; breaker drawing, 5.7 per cent; finisher drawing .4 per cent; slubber roving, 2.3 per cent; intermediate roving, three per cent; warp yarn, 2.4 per cent before slashing, 3.3 per cent after slashing in numbers, and seven per cent in breaking strength before slashing and 13 per cent afterward. The gain in breakage after slashing was 11.1 per cent, with a 14.5 per cent gain in weight. The variation in the weight of the finished goods was 2.4 per cent. The total loss in manufacturing was nine per cent.

Mr. Compton used several different single yards from the card sliver in testing, he said in response to a question from Mr. Tatum, and tested four bobbins at a time, taking the averages of each four bobbins and adding them up to get the general average. Mr. Tatum pointed out that at Bonham, the averages were taken from each individual bobbin weight, which made considerable difference.

At Waco, Mr. Clarke said, he makes a practice of weighing twice a day, and while he did not have the percentage figures, he reported that his 52-grain card sliver had an allowable variation of from 49 to 54.

"Do you ever find more than that?" asked Mr. Tatum.

Mr. Clarke explained that he had that much whether he wanted it or not; that of course if he found one varying more than that he went back to find out what the trouble was, but his experience was that even with all of the evening devices now in use, that was as close as could be expected.

The next figures reported were from Mr. Coman. "We made a test on the card sliver one and a half hours after stripping in the afternoon," he said. "On the first test we used weighings from every one of the 34 cards in operation—two of them were being stripped, and we got a variation in card sliver from high to low of 9.6 per cent. The first drawing extreme variation, from 32 deliveries, was 6.8 per cent; second drawing, 3.3 per cent; slubber, from half the spindles, 3.1 per cent; intermediate, 6.2 per cent; warp yarn, 4.8 per cent.

"That was the first test. We made a good many changes to see if the cards were taking out the same amount of waste except for flying. Mr. Hollingsworth weighed up the strippings from his top flats and found that there was a very great variation in the weight of the strippings, so we went to work on the settings of the front knife plates and found a variation in the weight of the strips from 25 to 50 per cent, but we have worked over that and have got all of our cards as nearly as possible to taking out the same amount. Our strips on a 40-inch card, 54-grain sliver, we try to keep at from 28 to 30 grains. They will vary from 22 to 38 grains, but we find that 28 to 30 grains to the strip gives us the best results.

Then we ran another test, with the following results: card sliver, 7.2 per cent; first drawing, 6.9 per cent; second drawing, 3.3 per cent; slubber, 4.2 per cent; intermediate, five per cent; warp yarn, 5.7 per cent. A decrease on some and an increase on others.

"The last test showed up as follows: card sliver, 7.2 per cent; first drawing, 4.3 per cent; second drawing, 2.5 per cent; slubber, 3.2 per cent; intermediate, 2.5 per cent; warp yarn, 2.4 per cent. However, we did not take any great number of weighings on the last test, and from the record sheets that are turned in daily we found that our card sliver showed a variation of 9.5 per cent; first drawing, 4.2 per cent; second drawing, 3.3; slubber, 4.7; intermediate, 3.75 per cent; warp yarn, 3.8 per cent.

Mr. Coman added that possibly he had not been taking enough weighings, or else his yarn was running more even than Mr. Tatum's.

"You eliminated a lot of variation in your figures when

you waited an hour and a half after stripping to take the weighings," reminded Mr. Moore.

"That was on the card only," pointed out Mr. Coman. "From the slubber on that wouldn't make any difference."

"We did not go to any trouble to pick out any particular cards," said Mr. Burow. "We just took one line of cards and ran the test through in about three hours, during which time they were stripped out twice, and we took the sliver from the bottom, top and middle of the cans, and we did the same way on the drawing. We put in one can at a time as it ran out."

"With regard to the variation at the cards, Mr. Coman asked, "how many know what each card is throwing out? Are you sure all of your cards are doing the same work?"

"I am sure they are *not*," answered Mr. Tatum.

Mr. Coman asked Mr. Burow what he had done to reduce the variation he found. Nothing especially, was the answer, as he had just completed the test. "However," he said, "you can't make the cards all take out the same."

Explaining this, Mr. Tatum said that their cards are 26 years old, and pointed out that Mr. Coman's are comparatively new—about three years old—and that would make some difference on this point.

"On our back drawing," Mr. Burow continued, "we creel it just as it runs out, and on our finisher drawing, we set it in a full creel at a time."

Answering a question from Mr. Coman, Mr. Burow explained that he took weighings from the bottom, top and middle of the cans, because if the card hands do not doff the cards as often as they should, there will be a stretch in the sliver at the top of the cans.

Mr. Towers made the next report. "I had an A. & M. man making this test for me," he said, "and I know these figures represent the actual conditions.

"We took twenty laps just as they came off the picker, and put them up on twenty cards with no preliminary inspection, and took two yards from each can at the beginning of the lap, from the middle and from the end of the lap, and we found quite a wide variation, running from four to 22 per cent. If you lump them together they will run as high as 24 per cent. While that looks pretty high it didn't scare us because it got back fairly well on the finisher drawing, where it dropped to six per cent. We took two yards from each can, hundreds of yards; on the slubber the variation was 5.7 per cent; on the intermediates we took 112 weighings from 112 different bobbins, and it jumped up to 9½ per cent, and that seemed to be about as high as it went; on the speeders it was 13.5 per cent, but we have some solid front rolls which are giving us a lot of trouble, but we are replacing them. On the speeders where we had changed the rolls we got it down to seven or eight per cent. On the spinning, we took 128 bobbins, and the average variation runs 12 to 13 per cent. If we could take out the two lightest and the two heaviest, our remaining average variation would be cut down to probably three or four per cent. In other words, if you test a hundred bobbins, your last bobbin may have a singling in it which would ruin the appearance of the whole thing."

At this point Mr. Clarke expressed it as his opinion that in such a case the wide extreme figures should be thrown out and not counted.

Mr. Coman asked Mr. Towers what changes his reports had led him to make in order to reduce the variation found. "Nothing especially," was the reply, "except to speed up the replacing of the solid rolls on the speeders. On our back drawing we try never to let a frame stop. The girl is standing right there, and when a can runs out she sets in another can. We creel from the back to the front. Each hand runs 32 deliveries, back and front."

"Do speeds on drawing have any effect on evenness?" asked the chairman.

"Yes, indeed," replied Mr. Towers, and he went on to say that "on the frames when we installed them, there was a break draft between the second and third rolls of 2.1 and the break draft between the third and back rolls was very small. We increased the draft between the third and back rolls to 1.26 and reduced the next draft step to about 1.65 or 1.70, and that made a very marked difference in the appearance of the sliver." Mr. Coman reported using drafts approximately like those of Mr. Towers.

Mr. Burow reported that he increased the weights on his slubbers from 18 to 24 pounds with better results in evenness. He makes a .46-hank slubber roving. At this point others reported hank rovings for eight-ounce duck as follows: Moore, .40-hank; Clarke, .48-hank; Coman, .54-hank; Lance, .45-hank.

"I think the difference in the hank makes a difference," commented Mr. Coman. "The heavier the sliver the more weight you must have in order to give the rolls a firm grip. The roll settings also have a great deal to do with that. We tried running some real low-grade stock and where we did it was absolutely necessary to put more weight on the rolls in order to get good drawings." This, he explained, was because the fiber was tougher.

A brief discussion of drawing roll speeds brought the meeting up to consideration of the next question. Mr. Towers started it by saying that he had reduced his front roll speed from 300 to 205 r.p.m., and now gets more production with three girls than he did formerly with four operatives. Mr. Dean, of San Antonio, said he reduced his speed from 285 to 225 r.p.m. and got a better production. Mr. Burow reported an increase in output by changing from 360 to 240 r.p.m.

Causes of Oil Stains.

The next question was briefly discussed. It read: "What are all of the causes of black oil stains on roving and yarn?"

In presenting this question, the chairman called attention to its universal presence in most mills, and said that "I presume most of you noticed the care that is being taken at the Worth Mills in regard to this question."

"Some times we have as much trouble with black oil spots as anybody else," said Mr. Burow. "Black work can come from so many different causes that you must try to keep it down at every process. To do this, to start with, we never find any black work coming through the cards, because if you have a black lap you cannot find it. We find some of the belt dressing we were using was giving us some black work. Too much oil on the drawing, also on the heads of the drawing, also, sometimes the cans are allowed to run too full—these are other causes. We find by not keeping our rolls as clean as possible we get a lot of black work. On the spinning frame, there is a 'ring' formed on the spindle which will fly off on the yarn. We try to keep that down by picking the spindles at each doff. Another thing: on the mornings when the spindle and bobbin gears are oiled, you can find after the first doff, that the bottom

of the bobbin is greasy, and we have instructed our frame hands to stack the roving in the boxes instead of putting it in as usual. When we started it they didn't like it but now they are used to it and don't mind it. It takes a little bit more time, but I believe it saves the difference."

Mr. Burden pointed out that sometimes an oiler might get too much oil on the stand right next to the head, which will run off on both bobbins on the end of the frame; also the section man, changing the draft gears, might start up the frame with greasy hands.

Carelessness in cleaning rolls, and putting up ends with greasy hands, were suggested by Mr. Whetstone as possible causes of the trouble in both the spinning and carding departments. His biggest trouble, however, is in the weave room, when a weaver ties in a broken thread, etc. He has eliminated a good bit of the difficulty, he said, by the use of a non-fluid oil on the crankshaft bearings, and, also, he has the hand wheels wiped every day.

"Most of our trouble came from cleaning off with compressed air," reported Mr. Dean. "We cut that down and eliminated quite a bit of it by cleaning with brushes."

Amount of Waste Taken Out.

The seventh question taken up was: "What percentage of waste do you remove at each process between the apron of the bale breaker and finished lap, using Middling cotton, Low Middling and bollies?"

Hugh S. Clarke, of Waco, was the first to report on a test on this question, and by request, Mr. Clarke's report is used here instead of his verbal summary of his findings, since it gives all of the information having a bearing upon the test. His report as submitted to the Association follows:

"In order that all members may interpret this test accurately, I shall give a statement of the conditions under which the test was conducted, and a brief lay-out of the machinery and equipment used: The weather in each test was clear, with sunshine and at temperatures ranging from 80 to 95 degrees, and with an extreme variation in relative humidity, between the tests, of from 43 to 46 per cent. Our opener room, as well as our picker room, stands wide open all the time, and has no humidifying equipment, and the humidity inside these rooms was from one to two per cent lower than the outside. A light south wind blew during most of the tests. Each test was made as carefully as possible and all weights quoted are exact.

"The cotton in each test was handled exactly the same and through the same machines, and no machine settings were changed. The cotton was opened by hand and mixed by handsful from the three bales into a bin and from this bin was fed by armsful onto the apron of a No. 4 Saco-Lowell bale breaker, which is connected directly to a Saco-Lowell vertical opener with screen section apron delivery. The vertical opener is equipped with adjustable grid bars, and the shaft runs 775 r.p.m. The cotton falls off the apron delivery into the open end of a suction pipe and is carried by this draft through four sections of English cleaning trunk and through a special trunk of our own design and is carried overhead to a No. 6 Saco-Lowell condenser hung to the ceiling of the picker room. The cotton runs through two 40-inch Saco-Lowell two-section breaker lappers—first section a three-blade 20-inch steel beater running 1,058 r. p. m. Fan speed, 1,200 r. p. m. Beats per inch, 21. Second section, a two-blade 16-inch steel beater running at 1,324 r. p. m. Fan speed, 1,120 r. p. m. Beats per inch, 14. A 42-yard lap is run in five minutes.

"Three 40-inch Saco-Lowell finisher lappers were used. Single section with a 3-blade carding beater running at 1,060 r. p. m. Fan speed, 1,080 r. p. m. A 13-ounce lap, 52½ yards, run in 7¼ minutes. Beats per inch, 49. All beaters in breakers and finishers have adjustable grid bars. Total beats per inch in picker room, 84.

"Test No. 1 was made with bollies, typical West Texas bollies, about ⅞-inch staple, not very hard staple, yellow spotted to yellow tinged.

"Test No. 2 was made with Low Middling cotton.

"Test No. 3 was made with Middling cotton.

	Test No. 1 Bollies (Per Cent)	Test No. 2 Low Middling (Per Cent)	Test No. 3 Middling (Per Cent)
Total weight 3 bales	1198 lbs.	1403 lbs.	1513 lbs
Bagging	2.70	2.61	2.41
Ties	1.95	2.08	1.92
Vertical opener	1.95	1.06	.75
Screen section delivery	.70	.57	.34
English cleaning trunk	.57	.24	.23
Special trunk	.60	.35	.33
First breaker section	1.70	.90	.61
Second breaker section	.95	.58	.46
Finisher lapper	1.02	.37	.29
Total waste	12.14%	8.96%	7.34%

"From these figures you will see that the total waste removed from the three bales of bollies was 12.14 per cent; from the Low Middling, 8.96 per cent; and from the Middling, 7.34 per cent.

"For our own information, we carried Test No. 1 on bollies through the cards and found that we took out 3.28 per cent fly and 3.65 per cent card strips.

"Our average cotton stock at Waco is Low Middling, and for the five weeks ending October 9th, we opened 300,400 pounds of cotton and got 9,157 pounds of card fly or 3.05 per cent."

Mr. Burow was the other member making a test on this, and he reported as follows: "We ran this test, and I have the figures here. However, we ran the test on just one bale of each grade.

"On the bollies, we had 3.5 per cent bagging and ties; the first vertical removed 3 per cent; the second vertical, 3.5 per cent; five sections of English cleaning trunk, 1.3 per cent; breaker picker, 1.1 per cent; intermediate picker, .4 per cent; finisher picker, .4 per cent. Both the intermediate and finisher pickers are equipped with Kirschner beaters.

"The test on the Low Middling showed 3.5 per cent bagging and ties; vertical opener, 2.4 per cent; second vertical, 1.4 per cent; English cleaning trunk, .5 per cent; breaker picker, .5 per cent; intermediate picker, .2 per cent; finisher picker, .2 per cent.

"On the Middling, bagging and ties figured 3.7 per cent; the vertical opener removed 1.5 per cent; second vertical, 1 per cent; English cleaning trunks, .6 per cent; breaker picker, 1 per cent; intermediate picker, .2 per cent; finisher picker, .2 per cent.

"The total percentage of waste on bollies was 13.1 per cent.

"The total percentage of waste on Low Middling was

8.5 per cent.

"The total percentage of waste on Middling was 7.8 per cent.

"We ran the tests all the way through after one another, under the same conditions all the way through."

After these tests were made, comment was offered upon the fact that in both cases, the amount of waste removed from the Low Middling was very close to the amount taken from the Middling grade bales, which, it was stated, was much closer than many mills believe.

Mr. Coman, on a test of two Low Middling and two bales of Middling, reported 9.90 per cent waste from the former and 8.39 per cent waste from the Middling."

The final question taken up was "On B grade duck, what percentage of size, dry weight addition to the warp yarn, gives best weaving results, and what percentage of this addition remains in the finished cloth? What percentage increase in breaking strength of the warp yarn do you obtain from sizing?"

Mr. Moore reported on this, as to the breaking strength increase resulting from sizing, that on a sample he had submitted, the breaking before sizing was 171 pounds and on the sized yarn 216½ pounds or an increase of 20 per cent, which, he pointed out, was three per cent better than the 17 per cent claimed by a compound manufacturer—whose particular product he did not happen to be using.

As to what percentage of added dry weight gives the best results in weaving, he declared this to be a matter of somebody's judgment. His best results, he said comes from an addition of 10 to 17 per cent size, with a moisture factor of around six to seven per cent. As to the amount lost in shedding, he figured this to be four per cent of the size applied, or about one per cent of the total weight.

This practically concluded the discussion, and the session, after a brief business session, was adjourned.

At this session, J. M. Gregg, secretary of the Southern Textile Association, outlined the work his association is doing, and upon motion of Mr. Poole, the Texas organization voted to sent a delegate to each semi-annual meeting of the Southern Textile Association with a report of the meetings of the Texas Textile Association, this to be incorporated in the Southern Textile Association Book of Proceedings. Mr. Poole was selected as the representative for the Fall 1926 meeting.

The concluding feature of the meeting was a luncheon, at which Mr. White, of Fenner & Beane discussed the cotton situation, and several of the braver souls attempted to lead the bunch in singing. In a short business session, Waco was selected as the meeting place for the Spring 1927 convention, the date of which will be announced later.

What the Southern Mills Are Doing

Control of the Henrietta Mills, of Henrietta and Caroleen, N. C., and the Edna Cotton Mills, Reidsville, N. C., has been acquired by G. E. Huggins, president of the Farish Company, and associates. The new owners secured the stock formerly held by Woodford & Morehouse, C. M. Woodford, W. S. Forbes, J. H. Thomas, K. S. Tanner, and J. B. Pitkin. After the first of the year, the Farish Company will be the selling agents for these organizations.

Leward Cotton Mills, Worthville, N. C., are installing an additional equipment of Stafford looms for the manufacture of sheetings.

Kendall Mills, Inc., have acquired the Mollohon Manufacturing Company, Newberry, S. C., which makes the second mill in this city to be owned by this corporation, the Oakland mill having been purchased last year. Kendall Mills, Inc., also operates several other plants in the Carolinas, at Edgefield and Camden, S. C., and Paw Creek, N. C. It is understood that the new owners will increase the spindleage of the Mollohon mill by about twenty per cent, and that other additions and improvements will be carried out.

The installation of 5,000 additional spindles is being considered by the Priscilla Spinning Company, Gastonia, N. C.

Carolina Fabric Mills, Inc., Laurel Hill, N. C., has been organized by Edwin Morgan, E. A. Morgan and J. D. Phillips. The capital stock is $200,000.

Sapona Cotton Mills, Cedar Falls, N. C., have purchased a complement of Stafford looms for making osnaburgs.

A new dye-house, kier room and drying room, to cost between $60,000 and $75,000, will be erected by the Revolution Cotton Mills, Greensboro, N. C., according to announcement.

Double capacity will be secured by the Steele Cotton Mills Co., Lenoir, N. C., by the operation of 6,000 new spindles which have just been installed. The new equipment is operated by Allis-Chalmers motors equipped with Timken bearings and the Texrope drive.

Burlington Mills, Inc., Burlington, N. C., will manufacture 80-inch bed spreads, it is announced. A building has been leased and the weaving machinery secured, it is stated.

Holt, Love and Holt is a new organization formed for the manufacture of wide textile novelties, at Burlington, N. C. Fifty Stafford looms will be used. Eugene Holt, W. Kirk Holt, A. Glenn Holt and J. Spencer Love are among those interested.

It is understood that the Mercury Mills, Inc., Charlotte, N. C., which acquired the Mecklenburg Mills Company in North Charlotte, will manufacture print cloth dobbies and that dobby heads will be put on most of the looms, with no additional manufacturing machinery being installed at this time. The product is sold through The Farish Company.

An extension to provide more space for opening machinery is being added to the Cabarrus Cotton Mills, Kannapolis, N. C.

Myers Mills, Inc., Gastonia, N. C., have re-arranged the carding machinery and will install additional cards.

Contract for the erection of seventy new houses in the village has been awarded by the Martel Mills for the Valley Falls plant at Spartanburg. The new addition to the mill will be placed in operation when the addition to the village is completed to house the workers.

Pacific Mills, Lyman, S. C., have let contract for the erection of forty-five houses in the village, to cost approximately $3,000 each. Lockwood, Greene & Company are the engineers.

Red River Mills, Rock Hill, S. C., are installing 22 new cards and complementary equipment, it is reported.

MATHIESON Chemicals

Textile Processing Economy

A MODERN trend in industry is towards greater economy in production through simplification of processes. In the chemical-consuming industries in particular, many processes may be simplified by the use of standard commodities in their most convenient and economical forms.

Among the textile mills, the general replacement of bleaching powder by liquid chlorine within the past few years is a notable example of this trend. There are many similar economies possible in textile processing, among which is the use of straight alkalies in place of the various alkali mixtures formerly in general use.

The replacement of these alkali mixtures by the proper straight alkali—58% Soda Ash or 76% Caustic Soda—shows a distinct saving in first cost, pound for pound, in addition to the fact that a substantially smaller quantity is required. Processing formulas once established with 58% Soda Ash or 76% Caustic Soda need not be altered or modified, due to variations in the alkali strength or changes undergone in storage.

Our representatives will be glad to discuss the advantages of Mathieson Soda Ash and Caustic Soda with interested textile men.

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Modified Virginia Soda
Aqua Ammonia

Deal Direct with the Manufacturer

According to established report, the Connecticut Mills Company, with plants at Danielson, Conn., and Taunton and Fall River, Mass., have decided to move a considerable portion of their equipment to some southern location which has not been selected at this writing. Obadiah Butler is president.

A sewerage system and fire protection equipment is being installed in the village of The Seneca Company, Seneca, S. C. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

An extension to the bleachery, to provide space for starching machinery, is being erected at the Ware Shoals Manufacturing Company, Ware Shoals, S. C.

An addition is being made to the plant of the Cannon Manufacturing Company, York, S. C.

Ninety-Six Cotton Mill, Ninety-Six, S. C., will be doubled in size by next Spring, according to announcement by the management. Architects are now preparing plans for a four-story addition, 245 feet long. Also, approximately 150 additional houses will be erected in the village. The present equipment of the plant consists of 24,000 spindles and 567 looms, which will be practically doubled.

The Arnco Mills, Newnan, Ga., have purchased Fairbanks-Morse ball bearing motors to drive the looms, spinning frames and most of the preparatory machinery.

Banning Cotton Mills, Banning, Ga., will add considerable equipment, including twisters, spinning frames and spoolers.

Columbia Mills, Columbia, Tenn., are carrying out considerable improvement work in the mill and village.

The capital stock of the Alta Vista Cotton Mills, Alta Vista, Va., has been increased from $750,000 to $1,000,000.

The new silk mill to be built at Elberton, Ga., will be known as the Seaboard Mills, and the Susquehanna Silk Mills are interested in the new proposition.

Colley Manufacturing Company, Elberton, Ga., has acquired an additional tract of land on which an addition will be erected.

Globe Cotton Mills, Augusta, Ga., as to replace existing Lowell looms with new Stafford models for the production of osnaburgs.

Munford Cotton Mills, Munford, Ala., have been purchased by a new organization, the Latsch-Hazlewood Cotton Mills, Inc., of which Otto Latsch is president and W. P. Hazlewood, vice-president. Mr. Latsch is general manager of the Southern Mills Corporation at Oxford, Ala., and Mr. Hazlewood is manager of the Adelaide Mills, Anniston, Ala. A. H. Quinn is secretary of the new corporation.

Western Textile Corporation, Wichita Falls, Texas, has been organized for the purpose of erection of a 10,000-spindle cotton mill at that place. D. C. McIntire is the principal owner, according to the report.

Official announcement has been made by Charles A. McCormick, treasurer, that the Chicopee Manufacturing Co., Chicopee Falls, Mass., will establish a branch plant at Gainesville, Ga. A site of 3,400 acres has been secured, and a plant of 50,000 spindles and 1,200 looms will be built. A village of 400 houses will be constructed. This will be the first of several units, others to be added in the future. Contract for the buildings has been placed with the Fiske-Carter Company of Greenville, S. C.

The New England Mill Situation.

Many difficulties are still standing in the way of recovery from depression in the New England mill districts but the gains being made are sound and are noticeable. At Fall River, where idleness was most prolonged the mills are now being operated to about 75 per cent capacity. In New Bedford, mills are running about 85 per cent capacity, while in centers outside of Massachusetts full operations have been pretty generally resumed. In New Hampshire there is a single exception in the case of the Salmon Falls mills where a recommendation has been made to liquidate the business, and in the case of the Amoskeag Company the plant is being run to about 70 per cent capacity.

Two failures of small mills at Fitchburg, Mass., have been announced, and a small plant in Western Massachusetts is also in difficulties. The troubles at the Hamilton mills, Lowell, have not been adjusted as yet although parts of the plant are in operation. In Fall River, the Seaconnet mills are still idle and in the hands of the city, for taxes. Fall River manufacturers recently held a meeting of protest against the excessive valuations and taxes upon mill properties and decided to pay only a part of the assessments pending a report by the board of assessors on petitions for rebates. The burden of restrictive legislation and excessive taxation is still heavy upon the mills of Massachusetts and New Hampshire, but mills in Rhode Island, Maine, and Connecticut are better treated by the local and state authorities.

Until the severe restrictions imposed upon Massachusetts mills are modified there is little hope of any great expansion there but many plants are being changed over from coarse goods production to fancies in all cotton, rayon and cotton, or silk and cotton.

Turning away from these bad spots, it is possible to find many instances of substantial recovery on a sound basis. The large Pepperell plant at Biddeford, Me., is not only running in full, but additional looms are being installed and some departments are being run overtime. The production of the Lady Pepperell sheet has proved a great success and there has been a broader demand for many of the other staple products of this old corporation. The Bates plant in Lewiston is doing a good business on fancy rayon bedspreads and on some specialties in colored cotton goods. The Hill Mfg. Co., in that center has been active on bleached and colored specialties.

In Lowell, Mass., the Massachusetts mills are busier. The Tremont & Suffolk has been undergoing a complete change of styling and new lines of blankets and fancy domets are being brought out. A stockholder has written a circular of protest against some of the new expenditures for management and selling but the new products are meeting with a good market reception and it is not thought that the complaint will be very seriously regarded.

In New Bedford, a strike of weavers has taken place, the first in a great many years, and the first that ever seriously affected the Dartmouth mills alone. In strike periods when all mills were affected, this one was closed with the rest, but the present troubles appear to be isolated and are an outgrowth of a system of fining applied in the weaving departments to secure better work. The fines rarely amount to $4,000 in a whole year and the strikers have been willing to lie idle a week and lose $35,000 in wages, pending readjustment.

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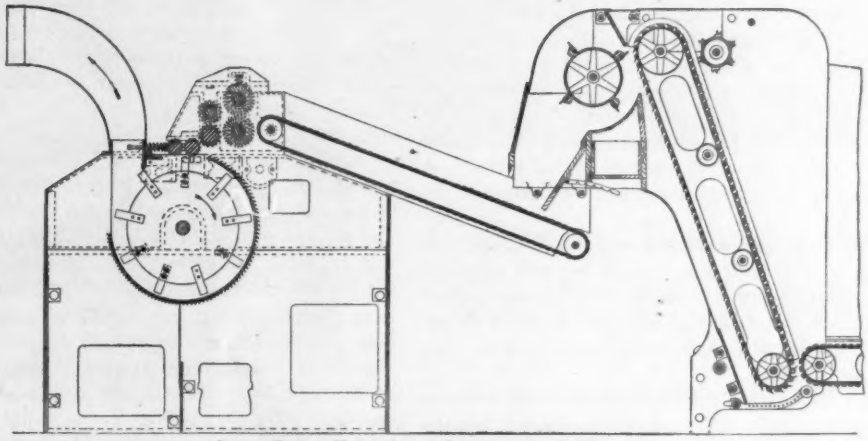

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LATTICE OPENER AND CLEANER

Removes, by means of the large grid surface, **the heavy dirt and leaf** imbedded in the cotton, which is well opened by the action of the Buckley Cylinder and Feed Rolls.

24" BUCKLEY CYLINDER

Cylinder entirely surrounded by grids, except for inlet and outlet.

New type Adjustable Grid Bars (patented)

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Newton Upper Falls, Mass.

SOUTHERN OFFICES

CHARLOTTE, N. C. GREENVILLE, S. C. ATLANTA, GA.

FOREIGN SALES DEPT.: Newton Upper Falls, Massachusetts, U. S. A.

Criticism against the selling efforts of some other New Bedford mills has resulted in changes of management but on the whole the mills in that center are doing about as well as fine goods mills can do in a year when hand to mouth ordering restricts contract business on fancy dress goods very generally.

The labor troubles at the Manville Co., Rhode Island, have been fully adjusted and the plants are running in full. They are producing many beautiful lines of draperies in rayon and cotton. They also produce many sheer colored wash fabrics in woven designs and as the call for those goods has been improving they are doing better.

The mill machinery manufacturers of New England still report a slow business on the whole. There is considerable business being done on renewals and repairs but new business coming forward is of a very moderate character. The machinery men feel that with lower cost cotton in sight, and with mills in the South again restored to full activity, it will not be long before additional new business will develop.

The finishers of cotton fabrics are still finding trade slow. They are averaging less than 65 per cent capacity. The printed goods business is smaller than anticipated, and white goods are doing only fair. The dyed goods divisions are running less than normal while sulphur dye plants are almost idle.

The large corporation printers and bleachers continue to run about in full and their activities account for the slow trade of many of the jobbing plants. The Pacific, American, and Windsor plants are running in full and are engaged largely on fancies of various descriptions, including many printed draperies. The latter, in cretonne styles, used to be the backbone of some of the business of New York converting houses but they are now unable to compete on the lower priced lines and this is reflected back in less work for the job printers.

The large printers announced in the middle of the month that they would continue their prices unchanged for deliveries from October to February. This action was taken in the face of declining prices for gray cloths and weak cotton markets. It was stated that as costs were greatly increased by the additional service and fast dye printing wanted that it was impossible to lower prices without loss to the plants.

Stability of prices has now become a cardinal principle with many New England selling agents. In the case of ginghams, selling agents declare that if buyers do not want the goods at prices that net mills a profit, no additional business is to result from cutting prices. Hence the larger plants are all standing pat for the spring trade on last season's prices and buyers are at last beginning to give new evidence of an aroused attention to ginghams for dress purposes for spring. During the slump in gray cloth and cotton prices the producers of the best known branded lines of sheets and pillow cases, and bleached cottons, stood pat on prices and buyers continued to purchase in small lots for quick shipment, just as they had been doing from the inception of the fall season.

There is no thought that prices can be held in this way on lines competitive with the South, such as brown cottons, denims, tickings, etc. But as mills making goods of this class now produce only definite high qualities to be sold under well known old brands, and as the output is limited, sales are not affected adversely by price stability. While many lines of staple tickings made in the South have been selling down as low as 18c and 18½c for 8 ounce goods, the Amoskeag Company recently booked the largest business it has ever done on its standard tickings on a basis of 20c for 8 ounce goods. In the same way, some denims made in this section have not been reduced below 17½c a yard with southern denims selling as low as 15c and 15½c on some grades, and the sales movement has been satisfactory and at a profit. It is not contended that the old volume of business is being done, but whatever is sold, goes onto the mill books as a profit.

During the past three or four years there have been many ridiculous and even slanderous statements published concerning the cotton industry as a whole, and the New England industry in particular, by critics who have assumed to know all that is to be known of mill management, art, etc.

At the last meeting of the National Cotton Manufacturers' Association held in Boston, Oct. 13 and 14, some of the most experienced men in the United States industry had something to say of this criticism. One of these men was James R. McColl of the Lorraine Mfg. Co., father of the president of the association, and himself a past president. Mr. McColl is one of the manufacturers who has been identified with fine and fancy cotton and worsted weaving in this country for two generations and was one of the first American members of the International Federation of Cotton Spinners. He is as well known in England and the Continent among manufacturers as he is here.

In an address delivered at the banquet of the association he said: "Having been for 45 years identified with manufacturing in New England, and also in close touch with conditions abroad in relation to both cotton and worsted, I have always felt that the marvelous development of fabric, finish, and artistic design during four decades has been entirely worthy of the enterprise and energy of the American people. The American manufacturer is not in a rut, but jumps quickly from one thing to another, with the result that competition in the production of fine colored goods has vastly increased."

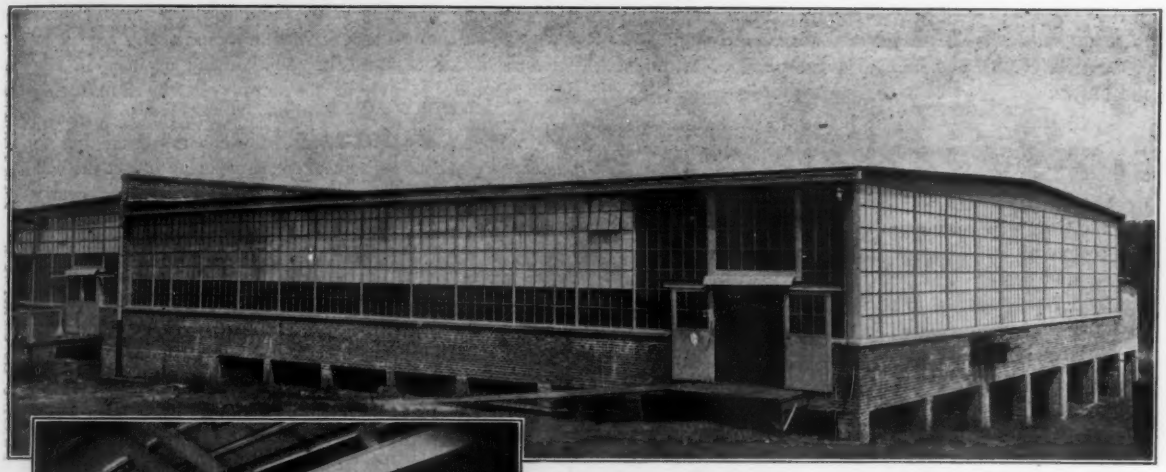
He conceded that some criticisms of recent years might have been well founded as applied to individual plants, but they do not apply to the present situation. Many mills are well managed by young men who have been thoroughly trained and are energetic and able. Machinery is of the best and finances are sound. There are some mills that have not lost money and are not likely to do so.

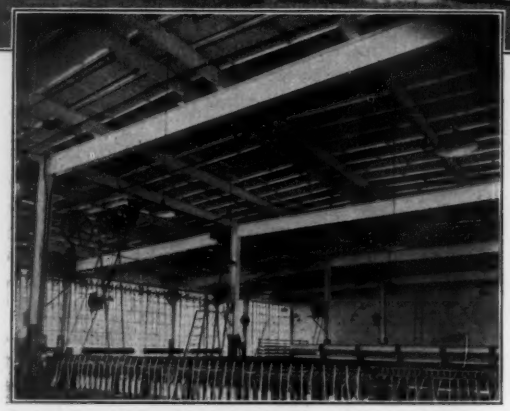
Somewhat similar sentiments were spoken by Ward Thoron of the Merrimack Co., of Lowell, a newcomer in cotton manufacturing but a hard headed New England business man, and by ex-Senator Lippitt who has been in cotton manufacturing since childhood. It is heartening to find men of that calibre beginning to hit back at the critics of cotton and the industry as a whole.

Cotton Comment.

BY H. AND B. BEER.

Once more the South, after a period of six years, is confronted with the problem of an indicated over-production of raw cotton, the folly of planting too large an acreage. As a result prices have declined more than six cents per pound or about $30 per bale since the opening of the





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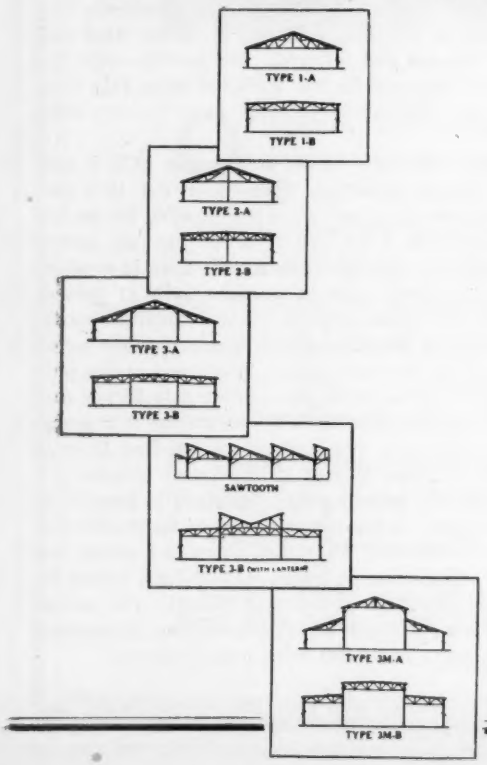

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present season—August 1st, which represents a shrinkage in values of the stupendous total of approximately $500,000,000 exclusive of the shrinkage in the price of cottonseed and linters.

The South has only itself to blame for the present state of affairs if the government crop forecast is approximately correct. Farmers disregarded repeated warnings to keep their cotton acreage down because of last year's big crop, and the then indicated large world's carry-over of American cotton at the close of July. Instead of decreasing their cotton acreage this year, growers increased the acreage by 1.7 per cent, or to 48,898,000 acres compared with last year's previous area of 48,090,000 acres. To-day the South is paying the penalty of having planted an enormous acreage to cotton.

Favorable weather conditions throughout September was the cause of the rapid improvement in the growing crop and the much larger crop estimates of late, according to advices from Washington. Government returns as of September 1st, indicated a yield, exclusive of linters, of 15,166,000 bales, returns as of September 16th pointed to a yield of 15,810,000 bales, and returns as of October 1st indicated a production of 16,627,000 bales, hence the recent slump in prices.

Consequently the trade, since last season's consumption was 15,165,000 bales of American, including linters, is faced with the probability of a large surplus of American raw cotton this season from this year's crop alone, perhaps to the extent of about 2,140,000 bales, which would have to be added to last year's carryover of 5,362,000 bales, making it possible for this season's carry-over to be about 7,502,000 bales against 5,362,000 last season, as noted by the following deductions:

American cotton—Bales	This season	Last season
World's carry-over August 1st..	5,362,000	2,991,000
Indicated crop, lint	16,627,000	16,104,000
Indicated crop, linters, etc.....	1,513,000	1,432,000
Indicated season's supply	23,502,000	20,527,000
World's consumption, if.....	16,000,000	15,165,000
Indicated carry-over July 31st..	7,502,000	5,362,000

But these developments as regards the indicated season's supply and probable carry-over at the close of this season, are probably pretty well discounted already by the recent sensational decline in the market, due to the hysteria in the interior, which now seems to be subsiding, confidence being gradually restored by southern banks and bankers and by the Intermediate Credit banks of the Federal Reserve System offering ample funds to the cotton growers to permit storing and orderly marketing of the crop until better prices are obtained.

Abiding by the suggested policy, storing and orderly marketing during the "peak" of the ginning season, which is now at hand, and assurance of a substantial decrease in next year's cotton acreage, would probably save the situation and most likely result in an advancing market ultimately.

The South has withstood such depressions in the past, and will likely work out of its present dilemma. Fortunately the South of to-day is stronger financially than it ever was, the result of the recent several years of high price cotton and industrial expansion, which has been the wonder of the age, and no doubt will take care of the present situation, and plan for a drastic cut in the cotton acreage next spring.

Meanwhile diversification of crops should be entered on a large scale. Planting of oats and wheat is possible and profitable in many sections of the western and northern portions of the cotton belt. The raising of hogs in the South should be revived, the supply in the South this year being the smallest in 40 years, which partly accounts for the high cost of provisions, of which the South has to buy largely and at a great expense, whereas it has the soil and climate to be self supporting and to be economically independent.

Experience is the best teacher. Warnings to reduce the cotton acreage next spring will hardly be necessary, it is likely to occur automatically by the planting of larger food and feed crops and by a more extensive diversification program at the expense of cotton.

With the exception of the years 1925 and 1926 when the acreage was increased, resulting in two consecutive record crops, and which is responsible for the present low price of cotton, there has not been a year during the past 20 years when the acreage was not reduced in the year following the making of a large cotton crop and low prices, such as prevail now.

The present price of middling cotton in New Orleans is lower than it has been since August, 1921, the memorable deflation year. The world's carry-over of American cotton July 31st, 1921, was the largest on record—larger by nearly 2,000,000 bales than it promises to be at the close of this season—9,364,000 bales vs. 7,502,000. Nevertheless, after August of 1921 the market gradually worked higher because of the reduction in that year providing a small crop.

The low price of middling cotton in New Orleans after August 1st, 1921, was 11.75 in August of that year, the market gradually and steadily advancing until middling cotton in the local market reached 22.75 in January, 1922, the result of a small crop, due mainly to the acreage in 1921 having been reduced to 31,678,000 acres compared with 37,043,000 in 1920. In 1920 the crop ginned was 13,271,000 bales, in 1921 only 7,978,000, hence the rapid and sensational advance that followed. The world's carry-over of American cotton, which was 9,364,000 bales July 31st, 1921, had been reduced to 4,879,000 bales by July 31st, 1922.

Upon reflection, since cotton, as it was in 1921, is now below the cost of production, it is obvious that it is now on an investment basis, and while it is possible for market to work somewhat lower, we favor buying, the spring months preferred, particularly on a scale down in event of values working lower. Cotton is undoubtedly at least at value at present prices, perhaps below its intrinsic worth. At any rate it is below the cost of production because of expensive labor, the high cost of living, due to the purchasing power of the dollar representing only 68 per cent of its pre-war value. Under the circumstances it is doubtful if cotton can be grown profitably at less than 18 cents per pound, as it costs at least 15 or 16 cents to make.

The situation, present and prospective, is hopeful in view of the steady increase of late years in the world's consumption of American raw cotton, which last season was 15,165,000 bales including linters vs. 14,247,000 season before last and 11,241,000 in season of 1923-24. This season, because of low prices, the world's consumption of American cotton may reach 16,000,000 bales, perhaps larger.

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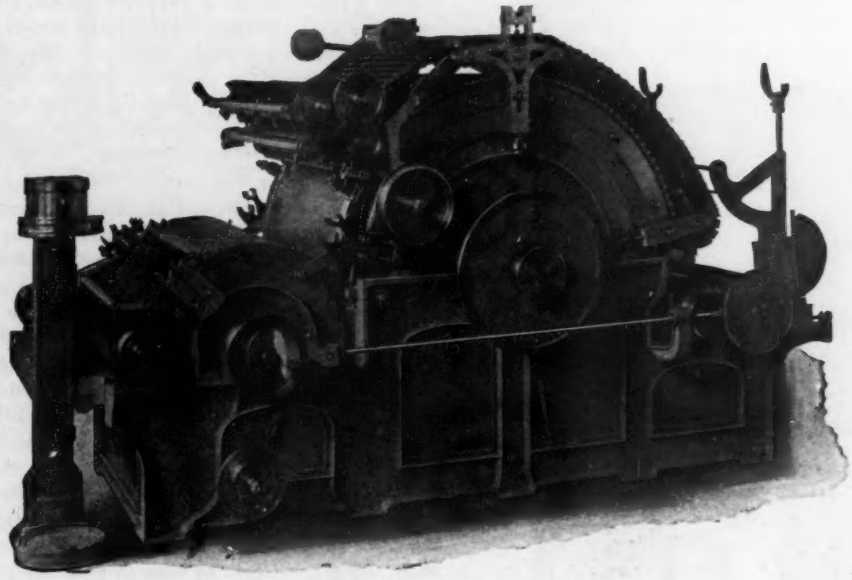

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Special bulletin sent on request.

Winston D. Adams Resigns.

Winston D. Adams, for ten years secretary and treasurer of the American Cotton Manufacturers' Association, resigned this position on October 19th, upon his physician's advice, because of the condition of his eyes. The resignation was accepted with regret by the Board of Government of the Association, and this severance of Mr. Adams' connection with the industry will come as a distinct loss to mill men, in a personal way and also from the standpoint of the industry as a whole. Mr. Adams' energetic efficiency, his charming personality, and gracious courtesy, together with ability and broad vision, equipped him admirably for the work he has pursued, and formed for him an important place in the industry and in the hearts of his associates.

In 1917, Mr. Adams was elected to the position of secretary and treasurer of the Association, at the annual convention in Washington, D. C., succeeding the late C. B. Bryant, who had held that position for sixteen years previous. At that time, the American Association was a loosely-knit organization representing only a relatively small percentage of southern mills, with limited activities and restricted revenues. Mr. Adams, with the co-operation of influential manufacturers, developed the organization into one of the strongest, most representative and virile trade associations in the country, embracing in its membership more than 90 per cent of southern textile plants, and with revenues commensurate with its work and importance. Many of the worthwhile achievements of the southern textile industry during the past decade, particularly in the line of diversification, the building of bleaching, dyeing and finishing plants, and the installation of such equipment as would lead to the production of finished fabrics to reach the consuming trade, are traceable directly to the broad-visioned work of the Association during this period. At the same time, the association prosecuted a campaign to inform and educate the public in other sections of the country as to the peculiar and distinctive features of southern textile development and the correction of misleading and erroneous reports as to such development, which had much to do with the wonderful strides that the southern textile industry has made in recent years.

Winston D. Adams.

The Association was quickly recognized as the accepted spokesman of this rapidly growing section, and for years has played a large part in national trade councils. Mr. Adams, as the continuing officer and executive secretary was charged with the task of seeing this great movement carried through, and the manner in which the work was done was such as to occasion wide comment.

During the war period, Mr. Adams was in charge of the Washington offices of the National Council of American Cotton Manufacturers, in daily conference with Government officials, in obtaining adequate and proper supplies of cotton goods for the Army, Navy and Surgeon-General's departments. For the past ten years, he has served as Joint Secretary of the National Council of American Cotton Manufacturers, the super-organization representing the entire textile industry of the country.

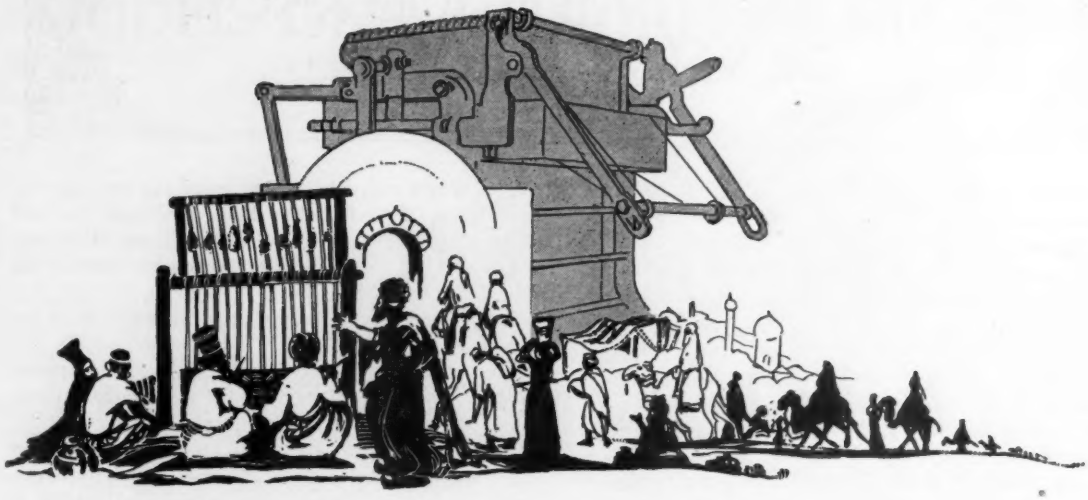
In 1919 he was Secretary of the World Cotton Conference in New Orleans, and in 1921 was Secretary of the American delegation that attended and participated in the World Cotton Conference in Liverpool-Manchester.

Mr. Adams is probably better known to all southern cotton manufacturers than anyone else in the country by reason of his long and intimate contacts with the industry. He is also a writer of note and is generally regarded as an outstanding authority on southern textile conditions.

At the meeting in New York at The Biltmore, Mr. Adams stated that he was compelled to tender his resignation on advice of his specialists, who stated that unless he gave up all work for a period, he would seriously jeopardize his eyes, which have been giving him much trouble for the past six months, necessitating several operations and hospital treatment both at home in Charlotte and in Philadelphia and New York.

The Board accepted his resignation and passed suitable resolutions of regret, at the same time appointing a committee to purchase a beautiful gift which will be presented him in the name of the Association.

Dissatisfied with certain regulations of the full fashioned hosiery knitters union in Philadelphia, quite a number of the members in the last few months gave up their employment in highly unionized mills to take jobs in strictly open shops, it is stated by manufacturers in Philadelphia who say they prefer the open shop plan for the reason they are less restricted in their selections of knitters, the better mechanics being in demand for operating new equipment. One of the more recent desertions from a closed shop was accompanied by the resignation of Harry West as president of the Co-Ed Knitting Co. He is a knitter and was a staunch adherent of the union, but took employment in the mill of the Endurance Knitting Co., which gives no recognition to the union. At the same time Frederick West, also a member of the union, resigned as a director of the Co-Ed and went to work in a mill that is not a tightly closed shop. These changes have caused much comment in union circles and are not displeasing to manufacturers, it is stated by representatives of both elements in production.



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Halton Jacquards for over a half a century have been weaving the designs of the finest products in our modern textile industry. Users of Halton Jacquards, knowing that their machines are of the best, are confident that the perfection of their finished products is assured.

We do harness building of every description.

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NOTES ABOUT MEN YOU KNOW OR KNOW ABOUT

ARTHUR M. DIXON, treasurer of the Dixon Mills and Trenton Mills, Gastonia, and vice-president of the American Yarn & Processing Company, Mount Holly, has been elected president of the Gaston County Textile Manufacturers Association. Fred M. Allen was re-elected secretary-treasurer.

W. M. MOORE, overseer of weaving at the Musgrove Mills, Gaffney, S. C., has been made superintendent of the Broad River Mills, Blacksburg, S. C., succeeding S. R. Power, who has taken a similar position at Chadwick-Hoskins Company's Mill No. 5 at Pineville, N. C. Mr. Moore was superintendent of the Globe Manufacturing Company, Gaffney, for a number of years.

J. H. BROWN has resigned as assistant superintendent and overseer of weaving at the Massachusetts Cotton Mills, Lindale, Ga., to become agent of the Stonewall Cotton Mills, Stonewall, Miss.

B. R. BURNHAM has resigned as superintendent of the Whitney Manufacturing Company, Whitney, S. C. A. S. Thomas has taken the position of superintendent and V. M. Montgomery of Spartanburg has been elected treasurer to fill the vacancy caused by Mr. Thomas' change.

A. H. HAMILTON has become superintendent of the Raeford Cotton Mills, Raeford, N. C., having resigned as superintendent of the Marlboro Cotton Mill No. 1. McColl, S. C.

S. E. REID has taken the position of efficiency engineer at the Cotton Mill Products Company, Pritchard, Ala.

STEPHEN D. BENNETT, superintendent and manager of the National Yarn and Processing Company, Rossville, Ga., died suddenly in New York in September.

G. C. TRUSLOW, superintendent of the Carolina Cotton & Woolen Mills Company at Draper, N. C., has been elected president of the Carolina Cooperative Council, composed of the operating executives of the company's several plants.

T. G. ORR, of Kinston, N. C., has accepted the position of general night superintendent at the Marlboro Mills, McColl, S. C.

R. HARVEY MAUPIN has resigned as superintendent of the James White Cotton Mills, Athens, Ga., to become superintendent of the Galvez Cotton Mills, Galveston, Texas.

L. H. RICE, superintendent of the Manchester Cotton Mills, Manchester, Ga., has resigned to succeed H. G. Coe as superintendent of the Brookside Mills, Knoxville, Tenn., where W. W. Arnold, Jr., is agent.

V. J. THOMPSON has been promoted to the superintendency of the Manchester Cotton Mills, Manchester, Ga., succeeding Mr. Rice.

J. T. (JACK) PHILLIPS, who has for several years represented the *Southern Textile Bulletin*, and, more recently, the *American Wool and Cotton Reporter*, has resigned the latter position to accept a traveling position with The Wilson Co., Greenville, S. C., traveling Georgia, Alabama and parts of other states.

J. O. BLACKMON, who several years ago was superintendent of the Hillside Cotton Mills, LaGrange, Ga., and who recently has been associated with Callaway Mills, Inc., New York City, has been made general manager of the Atlantic Mills, Macon, Ga.

A. F. GARRISON has been made superintendent of the Hartwell Mills, Hartwell, Ga., it is reported.

J. O. WILLIAMS, general superintendent of the Spencer and Spindale Mills, Spindale, N. C., will also be superintendent of the Cleghorn Mills, Rutherfordton, N. C. J. W. Cannady has been transferred to the Cleghorn Mills as assistant superintendent, and D. M. Williams has been promoted to a similar position from overseer of carding at the Spindale Mills.

J. J. AYLWARD has been transferred from superintendent of the Judson Silk Mill to the assistant superintendency of the Judson Mills, Greenville, S. C., succeeding H. E. Littlejohn, who has taken a position in the cost department of the Victor-Monaghan Company, Greenville.

GORDON H. MCCRAE, London, England, vice-president of the Independent Pneumatic Tool Co., is making a business visit at the home office in Chicago and factory at Aurora, Ill. Mr. McCrae is in charge of the London office of the company.

VERNON JOB, president, Independent Pneumatic Tool Co. of California, recently visited the Chicago office.

F. E. BROWN has been made cloth room overseer of the Aiken Mills, Bath, S. C.

S. L. SWORD has been promoted to the position of overseer of carding and spinning at the Jefferson Mills, Jefferson, Ga., succeeding E. L. Sheridan, who recently resigned to become superintendent of the Ensign Cotton Mills at Hampton, Ga.

J. A. SHINN has become manager of the Tupelo Cotton Mills, Tupelo, Mississippi.

G. C. BROWN has become overseer of spinning at the Adams Duck Mill, Macon, Ga.

J. WESTMORELAND is superintendent of the Willaimston Mills, Williamston, S. C. He formerly held a similar position at the Chadwick-Hoskins Mill No. 5, Pineville, N. C., being succeeded there by S. R. Power.

W. F. CHAVONS has become overseer of carding at the Aiken Mills, Bath, S. C., succeeding W. M. O'Daniel, resigned.

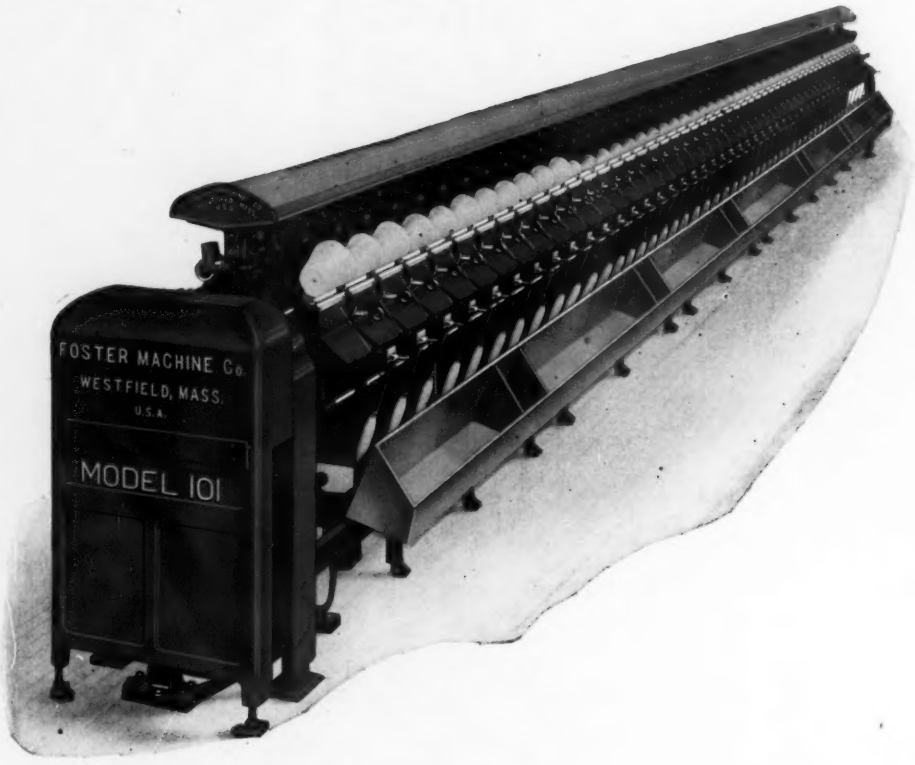
R. A. LAND has succeeded S. T. Godfrey as overseer of spinning at the Graniteville Manufacturing Company plant at Warrenville, S. C.

G. V. HOOVER has become overseer of carding at the Spencer Mills, Spindale, N. C. D. M. Williams was promoted to the assistant superintendency of the Spindale Mills.

W. W. MCLEOD has become superintendent of the Oakland Mill of Kendall Mills, Inc., Newberry, S. C.

A. W. ROPER recently accepted the superintendency of the Eagle Cotton Mills Company, at Madison, Indiana.

MODEL ONE HUNDRED AND ONE



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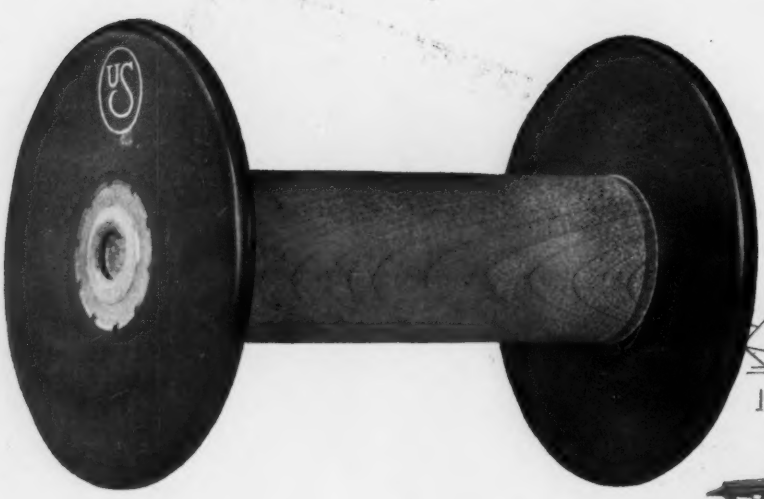

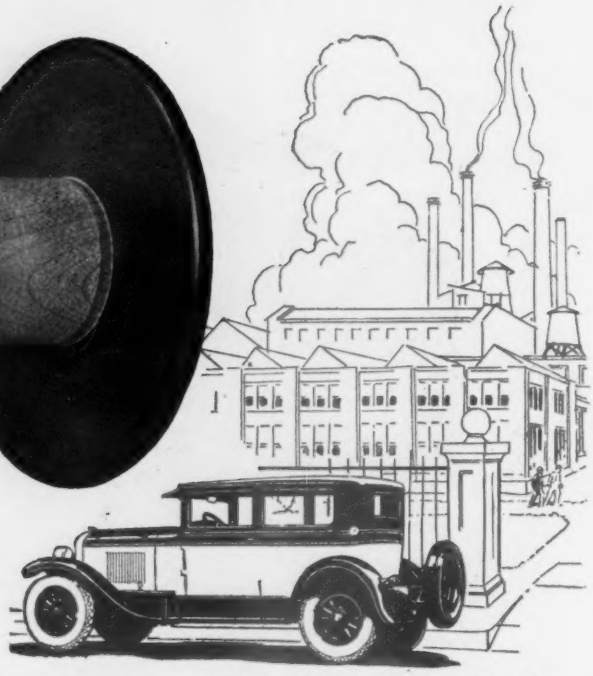

IN selecting a car you look for reliability, long life, freedom from repair bills, and untimely replacement. First cost is no indication of value. All things considered, a cheap car often proves more costly than a higher-priced car. Likewise in buying spools, cheap spools often cost more than higher-priced spools when the cost of frequent replacement is figured in.

U S Vulcanized Fibre Head Spools are the Cadillacs of the spool industry. Mill men are buying them for the same reasons that they purchase quality cars. With this spool, like a good car, your pride in ownership and sense of security is enhanced by the reliability, integrity, experience, and financial background of the manufacturer.

. . . and, in addition, years of service show that U S Vulcanized Fibre Head Spools cost less in the long run.

Judgment derived from over fifty years of bobbin and shuttle experience and over ten years' experience in making Fibre Head Spools, tells us that if you want the best type of spool that is made, we have what you want. Our reputation is behind the U S Vulcanized Fibre Head Spool.

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AN OLD TIMER SAYS

In working with zest and giving his best,
Just for the pleasure of the giving,
In the hope of helping his brothers along,
"Old-Timer" finds the sunshine of living

I went to town the other Saturday afternoon and not having any business and also not having any money to spend, I just walked and looked and thought.

I never saw so much "pulling" and "pushing" in my life—I thought, Gosh! what is the world coming to anyway.

I started into a fine building, and on the door in great big letters so you couldn't fail to see it, was a sign which said *"Pull."*

Well I "pulled" and got in. You know that is the way I have been doing all my life. I started "pulling" with every ounce of energy I had when I was running a section. I pulled to just beat the dickens out of every section man there was in that mill. I "pulled" my wrenches harder to make the nuts hold. I "pulled" my warps to my looms before the warp on the loom ran out. I "pulled" that warp in quicker than the other fellows. I "pulled" my levers (started my looms) on quicker than the other fellow. And—

I "pulled" myself out of bed just a little sooner than the other fellow every morning. You know as I walked around through that fine store I could think of thousands of ways that I "pulled" on that section. I saw some clerks in that store who were "pulling" like the dickens and I saw others that—(there is no use to tell you about the others because they will never be anything but clerks anyway). Yes, I thought to myself I sure did do some "pulling" and then I came to the door to go out and there was another sign, just as big letters and just as prominent as the one I had seen while coming in, but this sign said *"Push."*

Well, I said to that door, "now you are talking, old man—Push! Push!" And I "Pushed" that door so hard that I almost knocked a man down who was coming in. He wasn't accustomed to having doors pushed so blamed hard as I "pushed" that one (you know how I was feeling, don't you). Well, I picked up the gentleman's hat and apologized, begged his pardon, asked his forgiveness and wound up by telling him that was the way I had been "pushing" for forty years, and the way he looked at me I decided that I had urgent business down the street.

Yes, I "pushed" out my chest as I walked down the street and thought Good Lord, if some of these young overseers and superintendents could see now, how I "pushed" when I was overseer, they would think: "Is that fellow crazy, or just a natural born fool—"

"Push!" Boys I just simply never let that word get away from me. Sometimes when I was with one of my second hands and probably had not spoken for several minutes I would yell out to him "Push."

"Push what?" he would ask.

"Hell! 'Push' everything; go find something to 'Push.'"

* * * * *

Here is a little piece of poetry I found the other day that I wish every overseer and superintendent would take to heart. (I have changed it slightly.)

"Be a friend. You don't need money,
Just a disposition sunny;
Just the wish to help another
Get along some way or other;
Just a kindly hand extended
Out to one who's unbefriended.
This will make *you* some one's friend.

"Be a friend. You don't need glory.
Friendship is a simple story.
Pass the little errors blindly;
Lock on honest effort kindly.
Cheer the man who's bravely trying;
Pity the man who's sadly sighing.

"Be a friend. The pay is bigger,
(Though not written by a figure).
You'll have friends instead of neighbors
For the profit of your labors;
You'll enjoy life more in the end
Than a king, if you are some man's friend."

(Read it again brother! It gets better every time.)

* * * * *

And now let us tell one on "Old Timer." He likes to and does "lambaste" the editor on occasion but it is seldom that we can get back at him. This summer we got him so busy with Jim and his mill that he forgot to take his usual vacation and fishing trip. Now it's too late as he had to attend the Textile Show at Greenville and, like most mill men, he has to show up at the mill once in a while.—The Editor.

The Better Wage

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HOW OTHER MEN MANAGE

Practical Discussions by Cotton's Readers On all varieties of Mill Subjects

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Figuring Cloth Construction.

EDITOR COTTON:

I shall be glad to have contributors to COTTON tell me the best method for figuring the construction of cloth. Suppose I want to make up some drill weighing say 2.50 yards per pound from 14s warp and filling to be decided upon. What is the best method, or the one mostly used, that would give the weaver all the information he needs to go ahead and produce a sample? CONTRIBUTOR No. 1233.

Waterproofing Raw Cotton.

EDITOR COTTON:

Replying to your inquirer in a recent issue regarding waterproofing raw cotton prior to spinning, will advise that I cannot, for this purpose, recommend anything better than Acetate of Alumina. This is a standard chemical but is also sold under various trade names more or less confusing and, of course, at a much higher price than the standard solution itself.

All that is necessary is to give the cotton a bath of this chemical at 3 to 4 degrees Twaddle. The bath should be at room temperature and the goods should soak for several hours, after which they should be dried and then run as usual.

This is the same material that is used under fancy names for making khaki and cravenette and other waterproof cloths. Your spinning proposition is entirely new, but I do not see any reason why it should not work.

CONTRIBUTOR No. 361.

Beater Speed Comment.

EDITOR COTTON:

My letter, published in February COTTON seems to have stirred up a considerable amount of interest, judging from the large number of replies appearing in the May issue. The cases I mentioned were extreme, and I was sure they would meet with criticism, which was my reason for submitting them. However, it is interesting to analyze some of the letters answering my request for comments, and to notice the divergence of opinion.

The first letter, from "J. R. R. (S. C.)" gives a layout that apparently works well for him on 1-inch cotton, though even on such short stock, I should say he had too much beating. His bale breaker, Creighton opener, and C. O. B. machine should prepare the stock for proper picking with a minimum of beating. By the time the cotton has gone through the 30-inch Buckley cylinder it should certainly be well opened, and severe beating is not necessary to clean well opened stock, unless it is also very dirty, in which case it is better to use an extra C. O. B. or a horizontal type cleaner to remove the dirt, instead of making the beaters do it.

This layout gives beater speeds of 1400 r.p.m. for the breaker and 1200 for the intermediate, both equipped with two-wing blade beaters. The finisher, with a three-wing Kirschner beater, runs at 900 r.p.m., which is an equivalent speed of 1350 for the blade. These speeds seem higher than necessary.

"O. J. (Conn.)" recommends what I would consider a better arrangement, in his advocation of the striker beater. If the two-blade beaters in the line were replaced with striker beaters, "J. R. R." should get a better break in his yarn, using either the Kirschner, a blade, or another striker beater on the finisher.

Most men running long staple cotton will agree with "C. C. (N. J.)" in saying that the Kirschner should not be used on long stock.

"D. A. D. (N. C.)" brings up an important point in connection with beater speeds, in pointing out that while the same number of blows per inch may be had with a three and a two-wing beater, the greater damage to the cotton is worked by the two-wing, as it necessarily has a higher speed to give the same blows per inch. This contributor has, however, understated his case, as a beater running at 1800 r.p.m., will strike a blow two and one-quarter times as hard as the one running at 1200, instead of one and one-half times, as he states. The force of impact of a moving object is proportional to the square of the velocity, and is not directly proportional to it. This makes the case for high beater speeds even worse than "D. A. D." pictures it.

The Kirschner, or carding beater, is a great favorite with mills running short cotton, as it does less damage to short cotton than to long staple, and makes a very nice looking lap. "T. H. (Mass.)" states that he did away with these beaters and increased his breaking strength 15 per cent on 1-inch to 1 3/16-inch cotton. This increase on the 1-inch cotton is rather surprising, but I am quite sure that on 1 3/16-inch stock the Kirschner would be a bad proposition.

I have seen mills using Kirschner beaters on breaker, intermediate, and finisher, as well as plants using it on breakers with blades on intermediates and finishers. The Kirschner undoubtedly makes a nice looking lap, well opened and evenly distributed, but its action has always appeared to be too harsh for the good of the cotton. The pins on the Kirschner are sharp enough to penetrate any-

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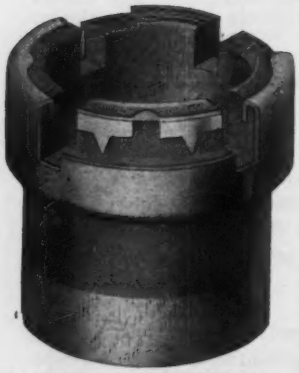

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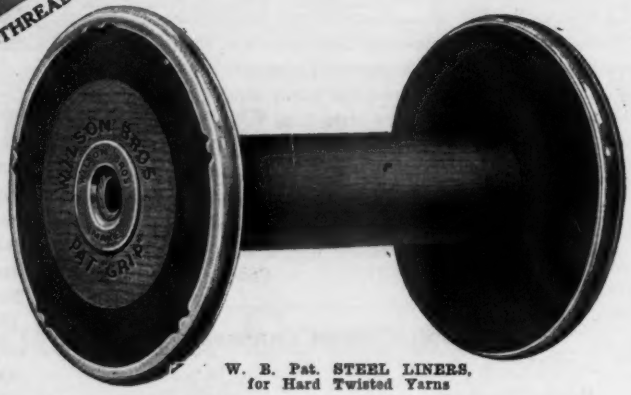

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thing in the lap, and they are sure to tear a certain percentage of matted fibers, and make neps in the cotton in so doing.

On very short cotton, this action is not noticeable to any extent, as the staple is so short that by the time the pins can catch the fibers they have passed completely beyond the feed rolls and will readily disengage from the sheet of cotton. On longer stock, the ends of the fibers are embedded more or less firmly in the sheet when the beater begins to touch them, and tearing is sure to occur.

One great trouble experienced with either blade or carding beaters at high speeds is a tendency to nep the fibers. The striker beater mentioned by "O. J. (Conn.)" practically eliminates this difficulty.

M. C. (MASS.)

A Discussion on Questions.

EDITOR COTTON:

Ever since my entrance into cotton mill work it has been a pleasure and joy to read COTTON. I especially enjoy the section "How Other Men Manage," and I would like to engage in the friendly warfare, so here is my beginning.

After reading "Old Timer's" trip through Jim's mill, I have been wondering what are the five most important points in the manufacture of cotton yarn. In other words, if you could ask a man only five questions, what would you ask to get the most information as to the quality of his yarn? Do not consider the counts. He might make 20s hosiery or 60s warp. But how good is he making it?

The reader should answer his own questions from his own mill.

C. A. B. (GA.)

Clothing Cards.

EDITOR COTTON:

The May issue of COTTON contained a very interesting letter from "Contributor No. 4351" who gave some very useful hints about card clothing and also pointed out some little errors other men make, which, by the way, ought to be a thing of the past in a matter of attention which is all important to card fillet. Still, as this correspondent informs us, through lack of care, serious results are obtained after the fillet has been mounted on any of the organs of the card.

While "Contributor No. 4351" gives a general idea of clothing cards, I thought perhaps his letter lacked somewhat in detail, as surely card mounting, as I know the game, needs a little more knowledge in order to arrive at a well finished job. So with all due respect to our friend, I intend to say my little piece about card clothing and chiefly the mounting of same on the respective organs of the cards.

Our friend says: "In the case of carders they should know that one of the worst features about card clothing is the way it is put on." But going one further I will say the worst feature develops after the fillet has been improperly mounted, and by the way, there are many cotton, woolen and worsted cards at the present time which are in that condition. The writer is aware of this and he knows that at least a few of these cards have been "clothed" or mounted by so called experienced men who were sent to do first-class work but, in my opinion, failed. Of course the aforesaid is just to remind our friend even so-called "card nailers" do not always comply with the set rules of card fillet mounting as learned by your humble servant and who right now will give those rules to all who are interested and probably some fellow who will correct himself on the job after reading and agreeing with my method as set forth in this letter.

This clothing or mounting of fillet on various organs of the card is a very important process and this same job should be performed by the best appliances and skill obtainable. Careless mounting will certainly produce different results from those we anticipate from the carding machine.

The recognized appliance which has been in use for many years has an indicating tension apparatus and the latter, of course eliminates the uncertainty of the degree of tension applied, as was the case years ago when the "card nailer" had no means of gauging same. In the mounting machine there are three chief features, namely: (1) The bed or slide with leading screw; (2) the tension head, with the indicator; this slides along the bed and is driven by the leading screw; and (3) the jack, which is screwed to the organ to be clothed, doffer or cylinder as the case may be.

So much for this description of the appliance for a card clothing job. Now let us take a practical case where say a card has been running for quite a long period and has only been clothed once, and through some cause or other it is found to be unsuitable for the work expected, so it is decided to reclothe both cylinder and doffer with new fillet, and of course the grade of fillet is selected for the stock in process. Here I must say that fillet should be kept somewhere about equal to the temperature of the room where the card to be clothed is situated and allowed to remain so until it is mounted on the cylinder, or doffer.

Having procured fillet, mounting machine and necessary tools, namely, small tack hammer, some No. 14 tacks, two good shoe maker's knives, one fairly long blade and the other short with curved edge, for trimming the joints of the ends of the fillet, also a nail punch, cold chisel and a piece of chalk, the operator has the necessary outfit for a first-class job. Proceeding with the job, the fillet is removed from both cylinder and doffer. To remove it from the cylinder at least two thirds of the flats must be removed and the loose chains laid well over to the front of the machine so as to be clear from the cylinder surface during the operation of mounting. Having done this it is advisable to raise all flat setting points a little to allow freedom between the flats and the new fillet on the cylinder when they are replaced, also "ease off" the doffer, front and back plates, under-screens and licker-in.

The old fillet is easily stripped off by means of a cold chisel, and a hammer. This done the surfaces of both cylinder and doffer are carefully examined for small wires which sometimes stick in the wooden plugs, which should be pulled out, also old plugs should be replaced with good tight ones, which may be leveled off to the surface by a wood chisel.

All the stray wires having been pulled out of the plugs and all the plugs in proper condition to hold tacks, the cylinder should be cleaned with emery cloth or sand paper in order to obtain a smooth surface, and to do this the writer has always found it convenient to have the cylinder run in the regular way, only somewhat slower, and to hold

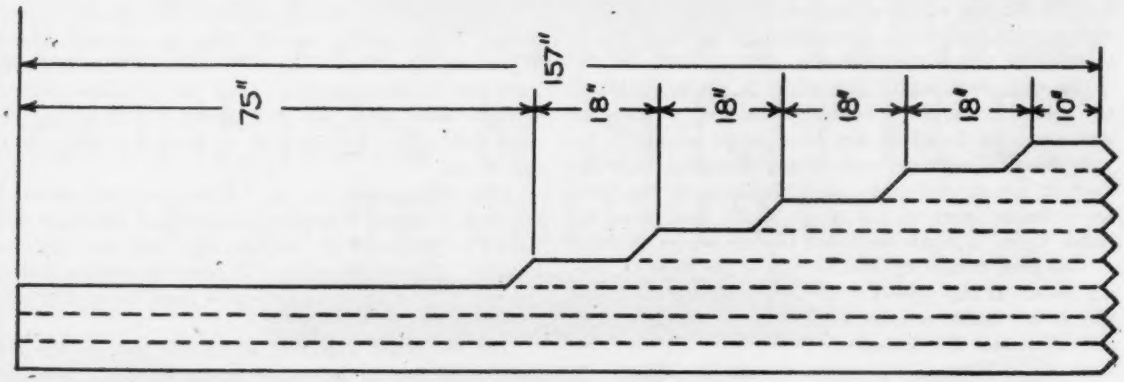

Fig. 1. Tail End Lap for the Cylinder.

the emery cloth on the surface. This method gives a good surface for clothing and also for the next procedure, this being to give the surfaces of both cylinder and doffer one coat of paint, which is usually composed of white lead, boiled oil and turpentine.

The correct mixture is usually printed on the package including the fillet, as prescribed by some makers. It is obvious that this coat of paint will eliminate all chances of dampness from attacking the surfaces and thus preventing rust which is sometimes found on cylinders and doffers when the old fillet was removed. This, of course, is the case in mills where the card rooms are not always kept at the right standard of warmth. However, after ascertaining that the paint is dry, the feed roll and plate and lap rolls will have to be removed to allow the assembling of the mounting machine, the bed of which is firmly bolted to either side of the card, at a convenient working distance from the cylinder. Onto the bed, the tension head is next placed, and then the jack is tightly screwed onto the most convenient end of the cylinder shaft, giving enough freedom of movement necessary for the rotating of the cylinder by at least two men. The jack is usually connected to the leading screw by a chain and gears, which enables the tension head to traverse the full width of the card, making mounting very convenient.

Before attempting to nail the fillet on the cylinder it is necessary to provide a guide as to where the wooden plugs are situated, and to secure this guide it is best to take the cold chisel and hammer and make a small mark opposite every line of plugs all around each side of the cylinder. This applies to the doffer as well.

The fillet can now be unpacked and unrolled, and given a rubbing with black-lead powder on the back, as this eliminates practically all the friction obtained between the back of the fillet and the surface of the part being clothed, thus making it easier to apply.

So much for the preparation for the real job, and now the next stage calls for care above all, and also a little judgment in order to be assured of a correct start in applying the fillet, and the best means of doing this is the "inside-tail-end" system, which insures an even circle of wire teeth on the extreme edges of the cylinder or other organ of the carding machine. This method assists materially in producing a full-edged sliver.

Let it be supposed that the cylinder to be clothed is 50-inches in diameter and the fillet two inches wide containing 8 ribs. The circumference of the cylinder will be approximately 157 inches. In commencing to mount the fillet it is necessary, at first, to ascertain the length of the first lap, and this is obtained by taking the correct end, that is the teeth pointing toward the front of the card, and turning the cylinder once around, having the fillet held tightly at the same time.

This first lap is the one from which the teeth are extracted in order to obtain the proper "tail end." Having

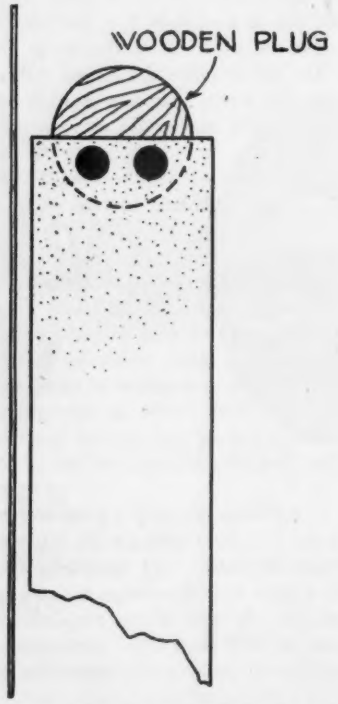

Fig. 3. The Way the Tail End is Fastened.

marked this lap at the point of contact after having lapped it once around it is ready for dividing and extracting the wire. A glance at the sketches will give a better idea of "tail end" making.

The lap for the cylinder as seen in the sketch is divided into sections commencing backwards with a space of 10-inches on the 8th rib, 18-inches on the 7th rib, and so on as shown, see Fig. 1. [For convenience in make-up this illustration is shown horizontally across the page, but by

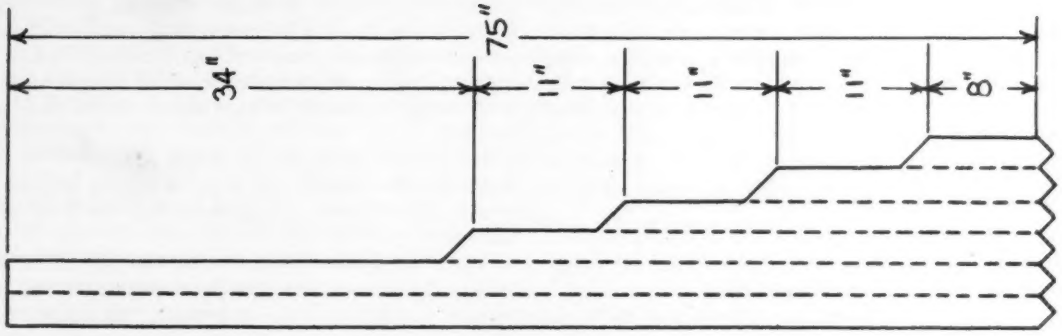

Fig. 2. Tail End Lap for the Doffer.

turning the page so the figures are right side up the "tail end" will be seen as it looks in practice.—Editors.]

In order to make this tail end after measuring off it is necessary to extract some teeth to facilitate the shaping of the lap, and this can be accomplished by means of a knife point or a specially made "wire puller."

Having shaped the first lap as shown in Fig. 1, the end is secured to a suitable plug, preferably nearest the edge of the cylinder, by two tacks as shown in Fig. 3. Of course

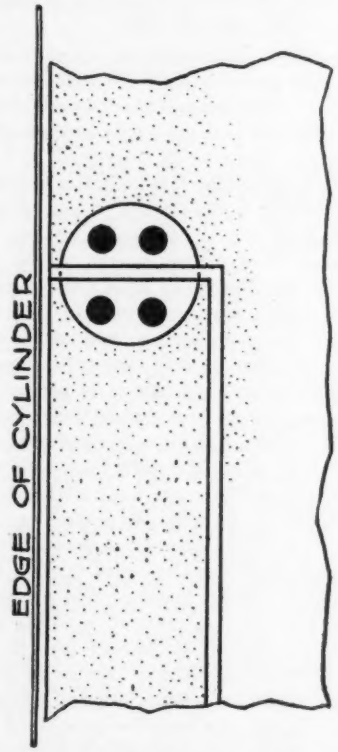

Fig. 4. The First Lap Joint.

it must be understood that the fillet is first wrapped over the cones in the tension head with the "tail end" leading under the tension screw and plate.

The end of the shaped lap securely fastened, that is, the three-ribbed tail piece, the wrapping on of the fillet should begin, and as soon as the four-ribbed section lays flat on the surface, tension must be put on by means of the tension screw gradually to the extent of 300 pounds. Now stop wrapping, but keep the tension well up and insert two or three tacks in the plugs. Then continue wrapping until the end of the fillet is reached, and the first lap completed. At this point it is important to keep the tension well up, or even add a little extra, which can be secured on the jack by the ratchet gear with this tension as stated. The fillet can now be secured with a double tacking crossways. The first lap secured, the tension may be relieved and a few tacks inserted in the narrow piece in order to ease the strain.

The next item is to fit the fillet in order to obtain the second and other laps. This second lap is similar to a dove-tail, and this is obtained by first measuring off from the point where the first lap is made a distance of 18-inches, and extracting the teeth from the third rib of this portion, at the same time gradually taper into the second rib, and measure another 18-inches and pull the teeth from the latter rib, and gradually taper into the first rib, and from the latter extract the teeth for 18-inches and this will finish at a point where it will reach the full width of eight ribs of fillet.

This latter operation gives a triangular shaped piece, and as stated it will be readily understood that the teeth are pulled out from the outer edge, and having done this the fillet must not be cut until the joint has been made as shown in the sketch of first lap joint. To make this joint perfect 350 pounds of tension is put on the fillet and two tacks are inserted as shown in sketch. This done, the triangular piece should be cut away carefully from the joint to a point where the full width of 8 ribs is attained. Winding can be carried on at 350 pounds tension right across the cylinder, to a point say about 1½ inches from the edge and tack the fillet securely. Then ease the tension.

Now winding on the fillet by hand, a chalk mark is made at a point where it touches the edge of the cylinder. About three inches above this point the teeth are pulled from the 6th, 7th and 8th ribs, as by so doing a basis is made for extracting the teeth as previously done in the first lap, only it is done in the reverse way.

This finishing end is shaped as stated and fitted all around the cylinder, the result being an unbroken edge of fillet save for the small space where the joints are made.

The method for clothing the doffer is the same in principle, but the measurements are different as seen in the sketch of the doffer tail-end, and the tension varies from 200 to 230 pounds. Of course before being able to mount the fillet on the doffer the card front will have to be removed and the mounting machine set in position as at the back of the card.

After having "clothed" both cylinder and doffer, the fillet should be allowed to stand a short while, after which crosswise tacking can be accomplished, using the chisel marks on the edges of the cylinder and doffer as a guide. Before replacing flats, etc., the writer has always found it necessary to have the cylinder run fairly fast, at the same time holding a long piece of hardwood on the wire, in order to even off any slight ridges which may occur by overlapping.

With the aid of the diagrams and this little advice I hope some little benefit will be derived from my effort to describe my way of mounting fillet.

In conclusion, I may say that I know men who clothe cards quite often, but do not know the way to make an inside-tail-end, and still wrap the fillet as on a common stripping roll. This doesn't ever look right for so important a job. D. E. (R. I.)

Paying Weavers by the Piece.

EDITOR COTTON:

We are running 98 looms on plain goods weighing 5⅓ ounces to 14 ounces per yard, day and night. I should like to pay my weavers by the piece without at the present time installing pick counters, and any suggestions along this line would be highly appreciated.

CONTRIBUTOR No. 998.

Analyzing for Texture and Cost.

EDITOR COTTON:

The manufacturer, immediately on receipt of a cloth for analyzing for texture and cost, should proceed in the following manner:

The cloth will be given to the designer, who may also be the cost clerk. He will also be given the particulars of width wanted when finished.

It is essential to have a reasonably large piece of cloth for a test, but where this cannot be secured, it is necessary for good work to have no less than three square inches, otherwise it becomes mere guesswork. The analyst first counts the sley and pick, notes the weave, whether a plain, dobby or jacquard, and places the design, draft and peg plan on point paper. Also if a stripe or check, writing out the pattern.

If it has a stripe in the warp and a full width sample is available it is easy then to ascertain the number of ends needed to weave the piece, especially noting the selvages. A good selvage always improves the selling of the cloth. If the cloth is plain, then he can tell the warp by the way the ends are placed, for unless exceptionally good cover has been made in the weaving, the ends will have a tendency to run in twos or as many ends as have been placed in one dent of the reed. In the majority of cloths the sley is a greater number than the pick. Also, in English cloths the warp is generally spun right hand twist and the weft the reverse or left hand twist. Also the weft has often less turns of twist per inch. Of course there are exceptions, but this is the designer's work; he must test for all possibilities such as warp or twist spun weft way or weft spun twist way. The number of turns per inch, staple and growth of cotton used such as Sea Island, Egyptian or American.

Some cloths lose the fine points if not made to sample and in case of colors in stripes or checks the brightness is lost on account of a difference in the number of turns per inch and the way warp and weft is twisted. Again the designer's skill comes in useful, he can, if he is at all practical, match his sample in hand against cloths made previously.

Cotton well carded and spun and especially if combed has a fine luster and if rightly spun, keeping in mind the strength for weaving, the appearince of the cloth is enhanced.

Cloth made from a warp twisted one way and a weft twisted the opposite way feels much softer, the web bedding better. In sley or pick counting the guage of the glass must be placed with the edge of the templates placed exactly between two picks or ends and counted to the full pick or end. Take a number of ends of the warp and if using any yarn balance, cut the ends of the length of the template supplied, which is marked "Cotton" and is 60 m/m each side.

As the warp threads are curled through going under and over the picks, which varies according to counts, strength, etc., they must be straightened, *not stretched,* until the kink is taken out, and in using the template this can be done by placing the thumb on the threads at one end of the plate the ends having been clipped level by a knife, then gently straighten these, holding tight until one can cut them to the required length.

These are placed on the hook of the yarn balance and the number of ends that weight the hook to the level of the guide rod is the correct counts of yarn in cloth. In the case of sized yarn the cloth must first be washed by boiling and cleared off in clean water, then dried, or to ascertain the weight of size weigh the threads before and after washing. The difference is the amount of size in the yarn.

In case of dyed yarn or bleached yarn these operations have had some effect on the weight. Some yarns lose weight when dyed. The writer made tests of yarns in the grey and afterwards when dyed both in the cop, cheese, cone and warp, and my advice is that data so collected is valuable to a designer or cost clerk. In bleaching most yarns lose weight from 8 per cent to 11 per cent. In case of napped goods the weft will often weigh much lighter. I have often noticed a fabric of flannelette, which we manufactured for years, the weft (the cloth was woven twill) which was of 10s super mule weft soft spun and generally weighed 15s to 15½ counts after napping.

The amount of size to be put into the warp is governed by the after processes the cloth goes through and by the weaving required. If for bleaching and dyeing and only a medium reed and pick, 5 per cent to 10 per cent of size is required if wet slashed. If beamed from the chain and dry slashed about 15 per cent of size, or in drills 20 per cent to 25 per cent. Some cloths sold in the gray are heavily weighted, but this can easily be ascertained by testing. Care should be taken that the yarns are perfectly dried after washing before commencing to weigh on the scales or balance for counts.

The foregoing procedure is gone through to test the weft. Generally the weft is pure; in some cases the weft is sized, in colored warp denims with white weft, or in colored jeans. One can ascertain the counts by comparing the threads against a known count or by twisting a number of unknown counts with a number of known counts, but the weighing system is by far the best. The larger the

sample, the more sure the test. Machines are made for various sizes.

To ascertain the contraction of warp and shrinkage of weft take out several threads and measure off a length, then straighten out and measure again. The result is the contraction or shrinkage which can then be worked out in percentages. If a new cloth is being made at a mill, the calculated contraction and shrinkage should be compared by the actual returns from the loom, then by means of a collection of this data the designer can always have a reference when making his calculations.

I am assuming in this letter that the cloth has been woven in a correct manner, for the weighting of a warp in the loom plays a great part in the contraction and shrinkage of warp and weft, also the behavior and appearance of the cloth after the weaving and in the finishing process if it is "cockled" or has kinks through the weft or warp not being tensioned rightly.

It is a good plan to keep a good quality pattern, cut from each new sort made, pasted in a book or fastened by means of brass pins and giving all the particulars of weave, counts of warp and weft, width, width in reed, processes and prices, class of yarn used, and in fact all data that will be useful for reference in the future.

All quotations should be numbered progressively and that number can be used throughout the life of the order (if any) throughout the mill and in any future orders of the same quality. The sales department can use it, just simply adding the initial or number code to each individual customer's order. I am now referring to special orders, not goods made to stock.

I will assume that I am in receipt of a letter enclosing eight different colorings of one pattern to quote for an order say of 480 pieces of 32-inch block check of 95 yards each in equally assorted patterns. I find on examination of the quality pattern that the sley is 84.75 ends and that the pick is 84 counts of warp and weft 44s and 44s. The white is blue or green tinted to match the colors (mostly Indigo tinted). The white weft testing 44s I suggest as this will have lost 10 per cent in bleaching (in weight) that we use 40s which on bleaching will give us approximately 44s being bleached in the yarn; also not having lost "body" it will help to show up the colors.

The colorings are red, pink, green, brown, blue sky, helio and black. Colors are fast to washing. The contraction of the warps will be 5 per cent and the weft shrinkage 4.197 per cent. The warp yarn to be made from long staple cotton double rove. The cloth width will be 32½ inches when woven, which should be ample for a pure "Scotch" finish slightly calendered.

The pattern in warp and weft is 24 white and 24 colored, so to arrive at the number of ends needed for the warp we multiply $84.75 \times 32 = 2712 - 4 = 2708 + 12$ ends 2/40s for white selvage = a total of 2720.

Woven plain on 4 shafts, the 6 ends of 2/40s and 2 ends on each side dented 4 ends in a dent, the remainder of warp 2 ends in a dent. The number of ends in a pattern is $2708 \div 48 = 56$ times $+ 20/48$, color and white being equal

$24 \times 56 + 20$	$= 1364$	ends white 44s.
24×56	$= 1344$	colored 44s.
Selvage	12	white 2/40s.
Total ends	$= 2720$	

The warp pattern would be as follows:

4 in a dent	6	white 2/40s selvage	
2 dents	2	white	
2 in a dent	8	white	56 times
1344 dents	12	white	
	24	color	
	12	white	
	8	white	
2 dents	2	white	
4 in a dent	6	white 2/40s selvage	
1348 dents	2720 ends.		

Checking or weft pattern: 24 white and 24 colored = 48 picks per pattern.

To find the width in the reed, and as we know the reed to be used is an 80/2 ends in a dent, or 40 dents per inch, we divide the number of dents per inch into the number of dents taken up by the warp ends, the dents being 1348 ÷ 40 = 33.70 inches.

To find the weight of weft wanted multiply the width in the reed in inches by the number of picks per inch. Multiply this result by the length of the cloth woven in yards and divide the result thus obtained by the numbers of yards to the hank, multiplied by the counts of the weft used. Add percentage of waste, using figures from actual practice, say 5 per cent.

The width in the reed is 33.70 inches, the picks are 84 per inch, the pattern 12 colored and 12 white, and the counts of weft used are 44s color and 40 bleached white. Then proceed as follows:

$$\frac{33.70 \times 84 \times 95}{840 \times 44} = 7.276 \text{ pounds of 44s weft,}$$

or 3.638 pounds of each, colored and white. As we are using 40s counts for white weft we must convert the 3.638 pounds of 44s to 40s counts as follows:

$$\frac{3.638 \times 44}{40} = 4.002 \text{ of 40s white weft. Then add 5}$$

per cent for waste allowance to the colored and white, viz:

$3.638 \times 5\% = 3.820$ pounds of 44s colored.
$4.002 \times 5\% = 4.200$ pounds of 40s white.

To find the total needed for the whole order of 480 pieces

3.820 pounds 44s colored	$\times 480 =$	1833.60
4.200 pounds 40s white	$\times 480 =$	2016.00
8.020 per cut of 95 yards		3849.60 pounds

To find weight of warp used 95 yards cloth + 5 yards shrinkage:

$$\frac{2708 \times 100}{840 \times 44\text{s}} = 7.359 \text{ pounds 44s warp per cut.}$$

$$\text{Twelve ends selvage} = \frac{12 \times 100}{840 \times 2/40} = .072 \text{ pounds 2/40s}$$

selvage yarn per cut.

Total = 7.359 + .072 = 7.431 pounds.

As these goods are for pure Scotch finish and sold by the yard, the weight may be needed for some purpose or other, so we must take into consideration that the white weft though 40s counts is, by weight, through loss in bleaching, practically 44s and the white warp is sized and though having gone through various processes will have still retained a good portion of it, so we can leave that to stand as it is, 44s. So for practical purposes we can safely say the yards per pound will be:

3.638 white weft.
3.638 colored weft.
7.359 warp.
.072 white selvage.

14.707 pounds per cut.

95 yards per cut ÷ 14.707 = 6.45 yards per pound.

As the actual weight is needed for yards per pound, these figures do not include the 5 per cent waste which is not in the cloth.

The warp particulars sheet should be made out as shown. The prices for dyes and yarns are merely figurative, just for example only. These are placed at the bottom of each column and an average struck.

Bleaching and dyeing on the spool by the Franklin process and afterwards beaming and wet slashing.

The yarn, I assume, is bought from the spinner in whatever form most suitable to the manufacturer, even if he spins his own yarns he must treat his spinning department as a separate concern if he is to know which pays the best, to spin one's own yarns or buy in the open market.

I am only illustrating a few of the systems. I leave the working out of costs to individual manufacturers. There are various factors for and against the different processes aforementioned, some of which I mentioned in my article in COTTON in June, 1925, under the heading "Preparation of Cotton Dress Goods for Weaving." The first costs saved may be dear in the long run, and that is the cheaper that enables the weaver to turn out a good cloth and in the quickest time.

WARP PARTICULARS

Order D. P. I.
May 30th, 1926
32-inch Finished Block Checks
84.75 × 84
32½ Loom state

33.70-inches in reed
80/2 Reed 2 in dent
44s warp D.R.
40s white weft
44s colored weft

Ends 2720	Warp yds.	Cloth yds.	Counts	No. Cuts to Patt.	2/40 Selv. ends										
Pat. Nos.	100 lbs.	95	44s			White	Red	Pink	Green	Brown	Blue	Sky	Helio	Blue	Total ends
701	7.431	"	"	60	12	1364	1344								2720
702	"	"	"	60	12	1364		1344							2720
703	"	"	"	60	12	1364			1344						2720
704	"	"	"	60	12	1364				1344					2720
705	"	"	"	60	12	1364					1344				2720
706	"	"	"	60	12	1364						1344			2720
707	"	"	"	60	12	1364							1344		2720
708	"	"	"	60	12	1364								1344	2720
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	480	96	10912	1344	1344	1344	1344	1344	1344	1344	1344	21760
Prices per lb.			44c		6c	6c	20c	16c	20c	16c	22c	14c	15c	17c	

(The prices for dyes include sizing assuming the foregoing is made into weavers beams by beaming and dry slashing).

White is 6c per pound.....	
Red and green is 20c per pound.....	.40
Pink and brown is 16c per pound.....	.32
Blue is 22c per pound.....	.22
Sky is 14c per pound.....	.14
Helio is 15c per pound.....	.15
Blue is 17c per pound.....	.17
	$1.48

$1.48 ÷ 8 = .1850 per pound as the average price of the dyed yarns.

Average price per pound for bleaching and dyeing is .12204 cents per pound.

The price for warp is 44 cents per pound in cross-ball or warp form.

2/40s on cheese for selvages is 52 cents per pound bleached.

Each mill must work to its own system of warp preparation, bleaching on the beam, also dyeing on the beam which must then be wet slashed.

Beaming from chains or cross-ball warps and rebeaming and dry slashing.

I suggest in the foregoing sample order chain beaming and dry slashing and bleaching and dyeing of the weft by the Franklin process, rewinding the weft by the rapid winders most suitable for the yarn, many of which are now on the market.

The weft particulars sheet must be made out in a similar form to the warp sheet.

For average price for dyeing per pound:

Red and Green, 19c.....	.38
Pink and brown, ...	.30c
Blue is 21c	.21
Sky is 13c	.13
Helio is 14c	.14
Blue is 16c	.16
	$1.32

$1.32 ÷ 8 = .1650 per pound.

Average price for colors, .1650 per pound.

Average price for white, .05c per pound.

Having ascertained the market prices for the quality of yarns needed, also cost per pound for dyeing, bleaching, etc., from our cost books, wages per pound for various pre-

WEFT PARTICULARS

Order D. P. I.
May 20th, 1926
40s white
44s colors

Price for 40s spools gray
41c per pound
Price for 44s spools gray
42c per pound

Patt. Nos.	No. of Cuts	Lbs. per Cut	40s white	44s Red	44s Pink	44s Green	44s Brown	44s Blue	44s Sky	44s Helio	44s Blue	Total
	60	8.020	24	24								48
	60	"	24		24							48
	60	"	24			24						48
	60	"	24				24					48
	60	"	24					24				48
	60	"	24						24			48
	60	"	24							24		48
	60	"	24								24	48
			192	24	24	24	24	24	24	24	24	384
			5c	19c	15c	19c	15c	21c	13c	14c	16c	

32" Block check — Quotation No. 1, May 30th 1926

cloth width 32" — colors in warp and weft equal proportion — Weft 33.70 width in reed, 84 Picks per inch

Finish Allowance 1/2 → 32.50

contraction 1.20 → 33 70

Reed used 80/2 in a dent → 2708

selvedge ends } 12 2/40s → 2/2720 → Hank of 800 yds

Approx 5% 21/1360 (64, 64, 1296 → " " 840 yds

Selv 2/40s 6 .30

Warp 44s 1290 29.32

134.80 → 26960 → 2/2830.80

colors 2/1415.40 Hanks of 800 yds

44s/707.70 16.084 lbs. of Color

40s/707.70 17.692 lbs. of white

Prices per Lb.

					$	¢
30 lbs	2/40s (cheese)	White wp.	.52 ¢			16
29.32 lbs	44s Colors	Grey wp. .44 ¢; Preparation .06 ¢; Bleach + Dyeing .12204 ¢		.62204 ¢	18	24
16.084 lbs.	44s Colors	Grey weft .42 ¢; Dyeing .1650 ¢; Winding .03 ¢		.6150 ¢	9	89
17.692	40s White	Grey weft .41 ¢; Bleaching .05 ¢; Winding .03 ¢		.49 ¢	8	67
					36	96
100 yds. warp 95 yds. cloth		Weaving price for 4 pcs 95 yds each		$9.52	9	52
		Miscel. expenses on above 4 pcs		$7.14	7	14
					4/53.62	

Price per yd. Loom State 0.1422 ¢

Finishing, Packing, Delivery, Discount .0350 ¢

0.1772

Profit 10% .0177

0.1949

Price of 95 yds of cloth 13.4050

Quoted 19 1/2 cents per yd.

Explanations are printed against the figures to illustrate their meaning. Anyone using such a sheet in practice becomes familiar with the method and no explanation is necessary. The prices shown are fictitious.

paratory processes and weaving and finishing prices, we proceed to make out a cost sheet.

A good system is to make out a cost sheet, shown herewith, for filing and reference for future estimates on the same quality.

As the cotton is worked out on the hank system which is 840 yards, and waste allowance is generally around about 5 per cent from yarn to finished product, we can take our costs based on 400 yards of warp woven in the loom.

Take the finished cloth width, add the width allowance for finishing, add contraction allowed in the reed separate. Multiply the result by the actual reed used (ends per inch). Divide by 2 which gives us so many hanks of 800 yards, which must be converted into hanks of 840 yards by the use of the divisor 21, which is practically the 5 per cent that we want to bring the actual pounds needed, i.e., divide

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FABRIKATION, BERLIN, GERMANY

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21 into the last total and subtract the result of the division from the said total and divide the result by the counts which will give the pounds required. If more than one counts are being used, then the proportions of each needed are divided by the counts.

For the weft take reed width, multiply by actual picks woven per inch, divide by 2 and the result by the counts used, and in proportion if more than one count or color is being used, as in the case of checks. There is no division to bring back the waste allowance as 5 per cent is allowed for waste in winding and weaving, the warp is bought in chain at calculated weight of 840 yards per hank.

The example of cost sheet shown will give the actual working out of a 32-inch block check. Having ascertained the pounds of warp and weft needed, we proceed to work out into actual costs, the results added gives us the price per pound dyed and prepared for looms of 400 yards of warp. Add four times the price of weaving, four times the price of actual expenses of stores, overhead charges, etc., which are obtained periodically from the general cost book and are generally termed miscellaneous expenses; divide the result by four, multiply the sum divided by the yards of cloth woven (in this case 95 yards) and this divided by 100 will give the price per yard. And the price per yard for finishing, packing and delivery; also discount allowed to customer, if not sold on a cash basis. Then add percentage of profit and the result is price per yard delivered. If all quotations are numbered progressively and this number is also used as an order number they are easily accessible for reference.

If the majority of the workers are paid by piece rate it is then easy to check back on the completion of the order the actual production cost of putting the order through the mill. There may be breakages, etc., that are not foreseen when quoting the cost.

C. W. (CANADA.)

Another Drafting Problem.

EDITOR COTTON:

I wish to get the recommendation of some of your correspondents for the drafts all the way through the mill including spinning running on 7/8-inch staple cotton and making 14s yarn. The hang-up of the mill is as follows:

The cotton is mixed in the hopper before a vertical opener in the proportion of two parts of good grade cotton to one part of poorer grade cotton. A breaker picker with two beaters and with a cleaning trunk located between the two beaters comes next. The first beater makes 1485 r.p.m. and the second beater running 1085 r.p.m. The beaters in this breaker picker are of the 3-blade variety and there is no intermediate picker. The finisher picker is equipped with a 3-blade Kirschner or spiked beater making 990 r.p.m. The weight of the finished lap is 12 ounces.

Going to the cards, the card sliver from this 12-ounce lap is 48.5 grains per yard. It then passes through two processes of drawing and over the slubber on which we are making .68 hank roving.

This .68 hank roving is used in two ways: Some of it is doubled in the creed on the speeder, making 2.00 hank roving; we also take this same .68 slubber roving and make it into 1.00 hank roving on the intermediate, after which it is doubled in the creel on the speeder and made into a 2.60 hank roving.

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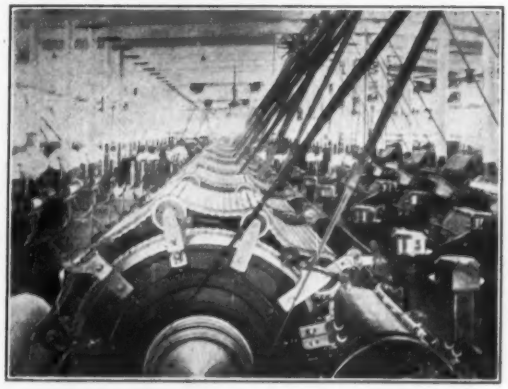

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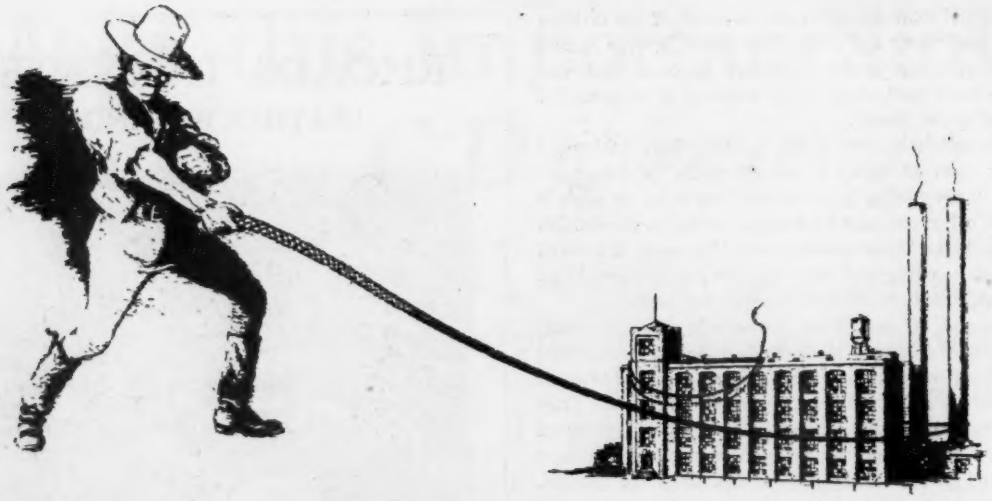

The Whip Hand

There is a phantom "Simon Legree" which is constantly lashing your factory. That phantom is fungi or dry rot. This insidious despoiler of production and profits thrives in the abnormally high humidity found in cotton and worsted mills. His natural habitat is untreated cotton mill sub-floors.

There is only one specific that bars the progress of this pest — creosote oil. It acts as a deadly poison in the food on which dry rot feeds.

But even such a powerful specific as creosote oil must be scientifically applied to make timber impervious to dry rot.

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These rovings are run on the spinning frames, the finest yarn numbers being 20s and running down as heavy as 14s.

I am more interested in the recommendations for the fly frames than for the spinning, but would be glad to have all the information given with reference to the entire lay-out.

As I am troubled at present with a great deal of very uneven yarn, it is to overcome this difficulty that I am asking for suggestions from other mill men.

I wish to add at this point that all the fly frames are equipped with solid front top rolls, and I am wondering if this would be any more likely to cause uneven yarn than would be the case if shell rolls were used in this position.

I shall appreciate greatly reading the opinions on this subject. CONTRIBUTOR NO. 6203.

Figuring Cone Outlines.

EDITOR COTTON:

In the late numbers of COTTON several articles have come to my attention concerning uneven tension of fly-frames caused by the shape of the cones. Several suggestions were offered in an effort to overcome this trouble, such as covering the bottom cone with calf skin, or some other material, but the truth most likely is in the shape of the cones, and in this letter it is my intention to outline a method for securing a perfect shaping of those cones.

To make a working example, suppose that the diameter of the empty bobbin is 1½-inch, and then layers of roving are added until it is built up to 3-inches in diameter. It can be seen that the speed necessary to wind on the same delivery, which is constant from the front roll for a 3-inch bobbin must be one half the speed necessary for the 1½-inch bobbin. Then we have found that as the diameter of the bobbin increases the excess speed of the bobbins must decrease in proportion to the increase in diameter.

This excess speed as we know is regulated by the cones, which are in shape concave and convex. The question comes, why? If the cones were of a uniform taper, naturally then so would the decrease in the speed given to the bobbins be uniform but the percentage of increase in the size of the bobbin is not uniform. For an example let the diameter of the roving be taken as ⅛-inch. Then when the first layer has been added to the 1½-inch bobbin the diameter would be 1¾-inch in diameter or the percentage of increase would be ¼-inch over 1½-inch or 16 2/3 per cent. Now suppose the bobbin is 3-inches in diameter. The next layer added will make it 3¼-inches, or the percentage of increase will be ¼-inch over 3-inches or 8 1/3 per cent. So we see that the percentage of increase in the size of the bobbin is constantly varying and we must do something to overcome it. Build the cones so as to compensate for the varying increase by making their taper vary in the same ratio or vary the distance the belt is moved along a pair of uniformly tapered cones. The first method as we know is the one adopted, so now to figure the shape of the cones.

One thing to be remembered is that the sum of the diamters of the two cones must always be the same. In order to keep the belt at an even tension we must have a basis to work on.

Example:—Diameter empty bobbin.....1½-inch
Diameter full bobbin 4-inches
Diameter top cone at start.....6-inches

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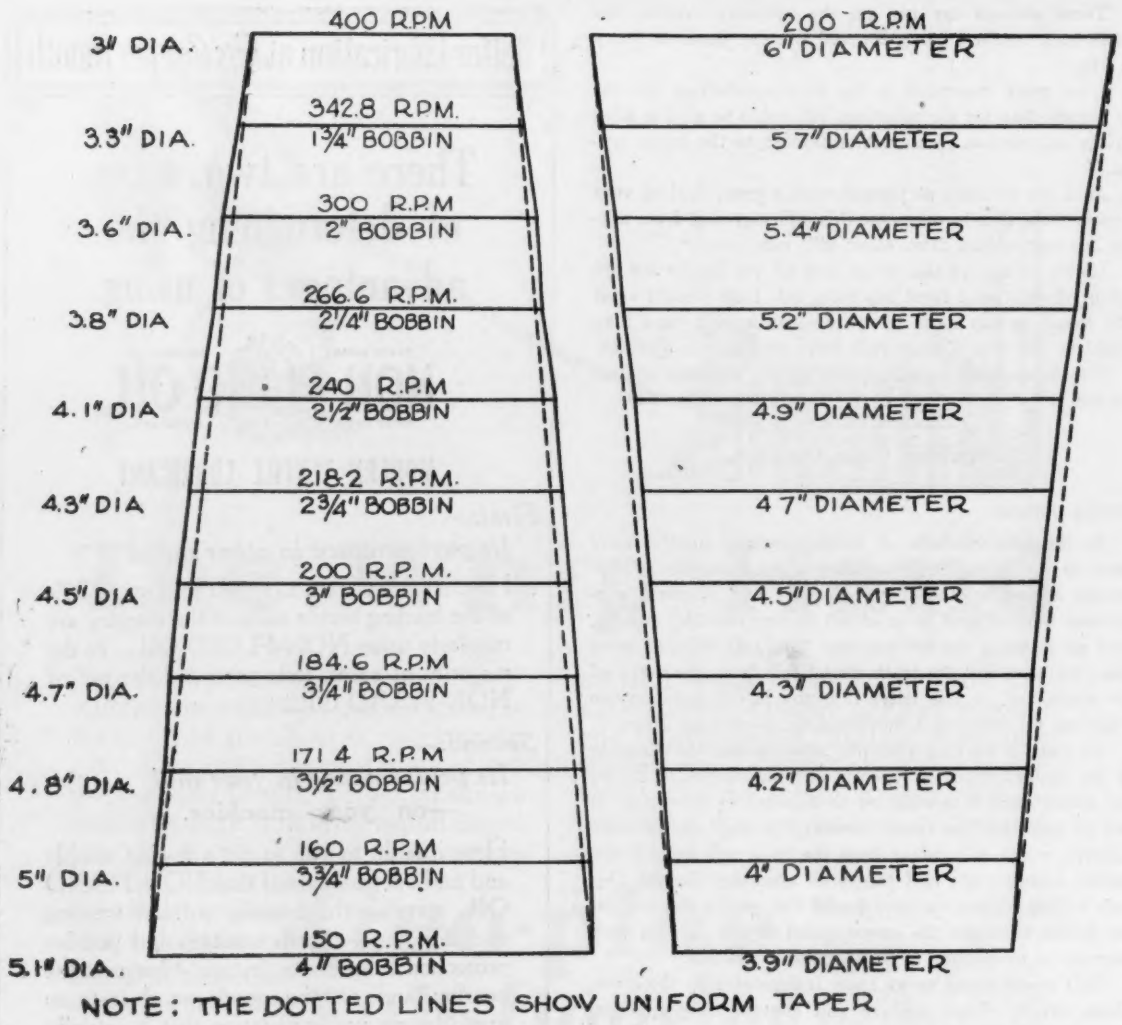

Diameter bottom cone at start.....3-inches
Length of cones 30-inches
R.p.m. top cone 200
Diameter of roving .....⅛-inch

To find the speed of the bottom cone at the start, $\frac{200 \times 6}{3} = 400$ r.p.m.

Now owing to the fact that the winding surface of the bobbin will increase proportionately with the diameter, and the speed of the bottom cone governs the excess speed of the bobbin, it remains that the bottom cone must decrease in speed proportionately. Example:—R.p.m. of the bottom cone when the bobbin is 1½-inch = 400; when the bobbin is 3-inches the r.p.m. the bottom cone should make would be $\frac{400 \times 1.5}{3} = 200$ r.p.m. And referring to the foregoing example we arrive at the following speeds:

Diameter of bobbin	Diameter of bobbin in ¼ths of an inch	R.P.M. Bottom cone
1½-inch	6	$400 \times 6 \div 6 = 400$
1¾-inch	7	$400 \times 6 \div 7 = 342.85$
2-inches	8	$400 \times 6 \div 8 = 300$
2¼-inches	9	$400 \times 6 \div 9 = 266.66$
2½-inches	10	$400 \times 6 \div 10 = 240$
2¾-inches	11	$400 \times 6 \div 11 = 218.18$
3-inches	12	$400 \times 6 \div 12 = 200$
3¼-inches	13	$400 \times 6 \div 13 = 184.61$
3½-inches	14	$400 \times 6 \div 14 = 171.42$
3¾-inches	15	$400 \times 6 \div 15 = 160$
4-inches	16	$400 \times 6 \div 16 = 150$

These are the required speeds of the bottom cone at each traverse. Then divide the length of cone into as many parts as are diameters. Next to find the diameter of the bottom cone at any of the foregoing points.

Rule:— $\frac{\text{Top cone speed} \times \text{sum of diameters}}{\text{Top cone speed} + \text{bottom cone speed}} =$ diameter of bottom cone.

Example:—When the bobbin is 1¾-inch in diameter:

$\frac{200 \times (6+3)}{200+342.85} = \frac{1800}{542.85} = 3.3$ inches diameter of the bottom cone.

And as the sum of the cones must always be the same (9-inches) then 9 inches — 3.3 inches = 5.7 inches as the diameter of the top cone.

My idea in sketching these two cones is in order to bring home this article to the reader.

CONTRIBUTOR No. 132.

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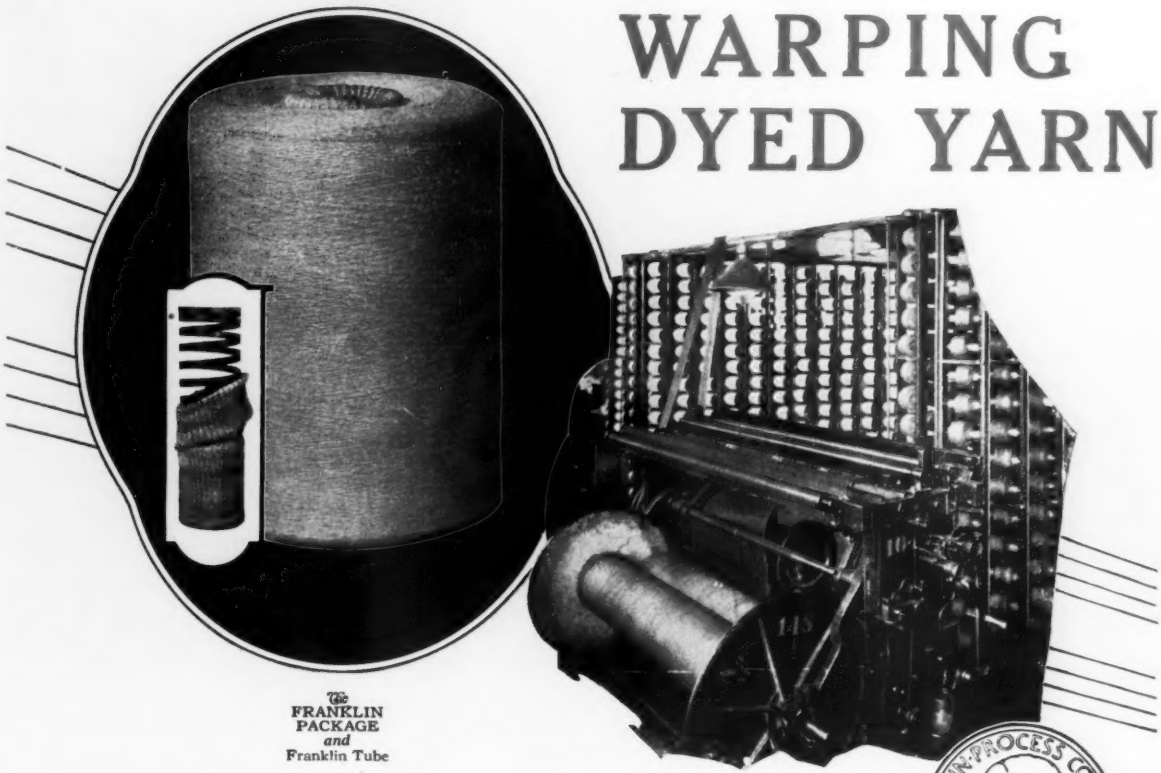

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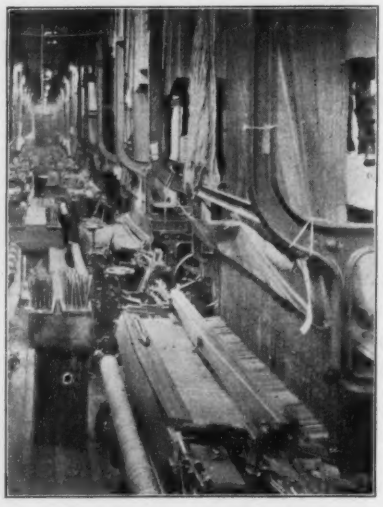

The photograph above tells a clean cut story of fine lighting in the harness. Remember it is from a general overhead illumination that carries deep into the machine. The smaller picture shows general view of looms. Note absence of glare and deep shadows. Both were taken in the Lund Textile Co. plant, Farnumsville, Mass.

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Answers Fly Frame Questions

EDITOR COTTON:

I would like to submit the following answers to the fly frame questionnaire by "Wash" on page 584 of the April number of COTTON:

1. The best answer I can give to this question is, that the compound pinion would never be changed, unless some one tried to make a slubber out of a jack frame, or vice versa.

If I remember rightly, "Wash" has been dragging the compound pinion in ever since the original thirteen states declared their independence.

2. This question is more useful. Condition in the creel, wrong tension or lay gears, plugged holes in the flyers, etc., will cause this in both the bobbin lead frames and the flyer lead. Put in a little more twist and see what happens.

3. Because on the bobbin lead frame the bobbin is required to make a greater number of revolutions than the flyer to wind the roving onto itself. The bobbin must run slower than the flyer, on the flyer lead, so that the flyer can wrap the roving onto the bobbin.

4. It is just as impossible to strain the ends on a flyer lead by raising the bottom cone as it is on the bobbin lead. The cone drive accelerates the bobbins on the bobbin lead, while on the flyer lead the cones serve to check the speed of the bobbins. So when the cones are raised, the bobbins slow down to the same speed as the spindles on the bobbin lead, and speed up to the same speed as the spindles on the flyer lead.

5. The roving would be strained on the bobbin lead frame if the train of gears driving the spindles were worn, or if the flyer pins were badly worn. I suppose this is intended to be a very clever "trap" for the bobbin lead advocates. Are we expected to get a bobbin lead frame out of the junk pile and hold it up as an example to prove that the whole bobbin lead system is all wrong? Would "Wash" condemn the pneumatic auto tire because one punctures now and then? "Wash" doesn't ask us if worn gears in the bobbin drive will stretch the roving on the flyer lead.

6. As to question six—if spindles were plumb and well oiled, there is no question in my mind but what the pressers should be able to revolve the spindles.

7. "Wash" might be interested to learn that a bobbin lead frame can be converted to the flyer lead type in a very short time, and the same cones used for either system.

8. Therefore, it might seem as though his question seven has nothing to do "as regards unequal conditions."

9. It undoubtedly is of some aid to the cone belt. There is one big feature on a flyer lead that *very greatly* aids the cone belt. In fact it is the only advantage that the flyer lead can honestly claim over the bobbin lead. I am not going to say what it is in this letter.

10. This is just another way of asking what aids the cone belt.

11. To say that a lower grade stock can be run on a flyer lead is wrong. "Wash" has in mind more presser pad thoughts. Another of his unequal conditions that doesn't exist.

Now I would like to ask three questions and will be glad to see a reply from "Wash."

1. What changes would be made in a bobbin lead frame to run reverse twist? Tell us more than one way of accomplishing this result.

2. What changes would be necessary to convert a bobbin lead frame into a flyer lead.

3. If, in running a frame it were necessary to change from the ordinary amount of twist, to a roving having very hard twist, what changes would be necessary?

Please notice that I haven't asked any question requiring any trick experiments before a logical answer can be arrived at.

G. C. R. (MASS.)

EDITOR COTTON:

In the April issue of COTTON I note that "Wash" asks some questions on flyer and bobbin lead fly frames, which questions I shall endeavor to answer.

Question No. 1. If when changing the differential or compound pinion the proper change is made throughout the frame, the size of the bobbin will not be affected. For example, take the diagram in the January issue and change the differential or compound pinion so as not to affect the size of the bobbin.

Assuming a 40-tooth twist gear, the speed of the compound shaft is

$$\frac{468 \times 40 \times 6.5 \times 19}{39 \times 3.25 \times 60} = 304 \text{ r.p.m. of take-up shaft.}$$

$$\frac{468 \times 40 \times 71}{39 \times 130} = 281.83 \text{ r.p.m. of the front rollers.}$$

Front roller is 1⅛-inch in diameter, then

$$\frac{1\frac{1}{8} \times 22}{7} = 33.536$$

$281.83 \times 3.536 = 996.6$ inches delivered by front roller per minute.

If the bobbin is 1½ inches in diameter when empty, then

$$\frac{1\frac{1}{2} \times 22}{7} = 4.7 \text{ circumference of bobbin.}$$

$996.6 \div 4.7 = 212$ r.p.m. of bobbin to wind on the roving delivered.

Assuming the two bobbin bevel gears to be 44 and 23 teeth respectively, then

$$\frac{212 \times 23 \times 33}{44 \times 53} = 69 \text{ r.p.m. of sleeve gear.}$$

$69 \div 2 = 34\frac{1}{2}$ r.p.m. of sun wheel or gear.

$$\frac{34\frac{1}{2} \times 124 \times 60}{36} = 7130$$

Divide 304 r.p.m. of compound pinion into 7130. This will give the compound or differential pinion to give the bobbin revolutions required to wind on the roving delivered.

To prove this calculation let's figure the speed of the sleeve gear through the cones.

Example:—

$$\frac{468 \times 40 \times 6.5 \times 19 \times 23 \times 36}{39 \times 3.25 \times 60 \times 60 \times 124} = 34.5 \text{ revolutions of}$$

the sun wheel or gear.

Then $34.5 \times 2 = 69$ r.p.m. of sleeve gear.

$$\frac{69 \times 53 \times 44}{33 \times 23} = 212 \text{ r.p.m. of the bobbin.}$$

Now if the correct lay gear and tension gear are used the change in the differential pinion will not affect the size of the bobbin. "Wash" knows this without being reminded of it.

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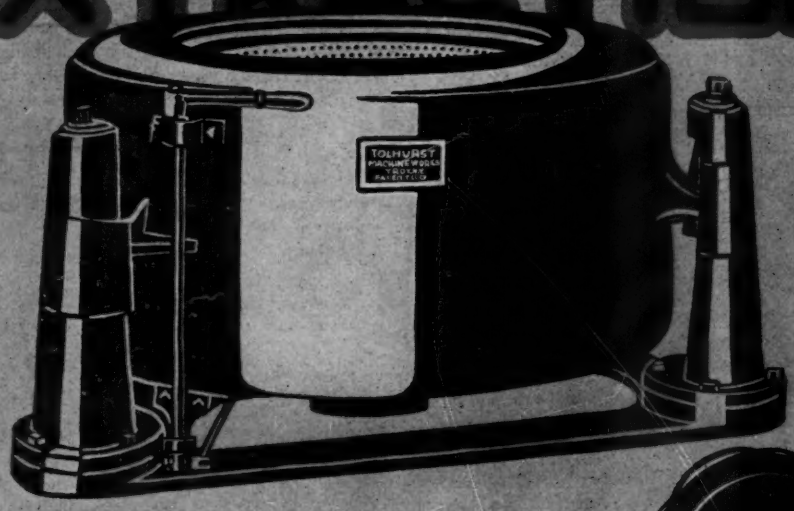

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The compound pinion on this make of machine is changed only when more or less twist is desired and only then when a twist gear of the correct number of teeth cannot be used. This compound pinion is sometimes changed to gain twist without cutting the speed of the delivery roller and the results are just like "Wash" stated in the January issue of COTTON.

Question No. 2. If "Wash" will weigh two of his finished drawing slivers, piece them into the slubber and make two full bobbins, then take a yarn reel and reel them off both together, he will find some roving left on the heavier one. This is due to both being drafted the same in the slubber and the surface velocity of the bobbin being made from the heavier sliver becoming greater than the other one. The roving made from the heavier sliver must stretch, consequently more yards of roving is wound on the bobbin with the greater surface velocity. This is only one cause for question number two.

Question No. 3. The bobbin in the bobbin-lead fly frame only leads the spindle the required number of revolutions to wind on the roving delivered by the delivery roller without stretching the roving. The bobbin lead also takes off strain whereas in the flyer lead strain is put on the cone belt as the bobbin builds.

Question No. 4. This I think is due to the bottom cone turning backwards when being raised and will carry the bobbin train of gears with it, which on the flyer lead will strain the roving, as the cone and gear will have to move just a little before the bobbin can start, and during this pause of the bobbin the flyer is moving on, while on the bobbin lead a little slack will show as the bobbin has lost on the flyer.

Question No. 5. Those would strain the roving, however, they can and should be replaced with new pins, and new gears can be put in, while in the flyer lead the cone belt is likely to slip at any time and cause the same results, and regardless of how the belt is cared for, there will be some slip when starting the frame, while in the bobbin lead, once new gear and pins are put in the flyers this part is in good repair for a long time.

Question No. 6. I have never seen a bobbin lead frame with so much pressure of the presser pads as to revolve the spindle, and if "Wash" runs his frame this tight I don't doubt his having stretched roving.

Question No. 7. This is partly due to the imperfect condition of the flyer lead frame and also to the differences in the ratios of the spindle and bobbins in the two makes of machines.

The answer to Question 7 also answers Question 8.

Question No. 9. This is as stated by "Wash." However, this aid is not as great as that in the bobbin lead frame. which takes strain off the cone belt as the bobbin builds.

Question No. 10. I for one fail to see what lower stock anyone should wish to run than card strips made from ⅞-inch cotton. I have seen this run on bobbin lead frames and the results were good.

Now with reference to the firmness of the bobbin in both makes of machine. In the bobbin lead the vertical rod of the presser pad is made heavy enough so the centrifugal force of the flyer will throw this rod outward thus causing the presser pad to rest and put some pressure on the bobbins, while in the flyer lead the action is reversed. As to work running well, not long since I asked one slubber hand to let me know how many ends came down on one slubber

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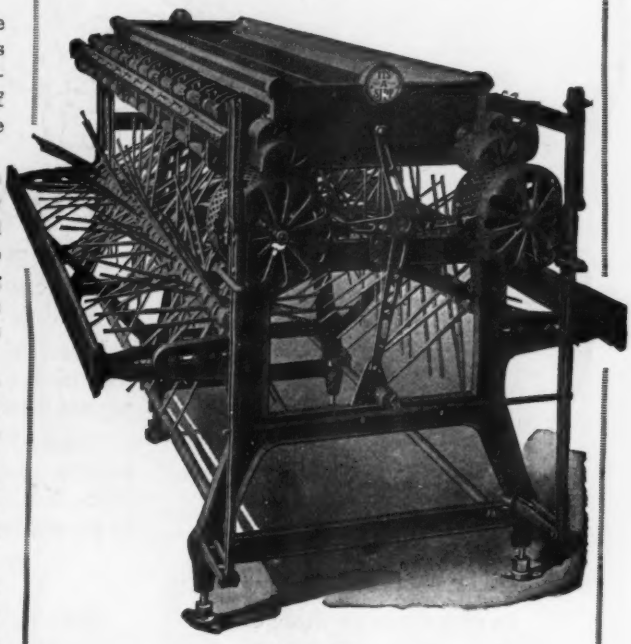

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in eleven hours and why, the slubber making .70 h.r. with about 7/8-inch cotton and 65 per cent relative humidity. This man had four ends down, this being caused from the sliver breaking. T. A. A. (S. C.)

EDITOR COTTON:

Under the heading, "Flyer Lead and Bobbin Lead," page 583, of the April. 1926, issue of COTTON, "Wash" asks some more questions.

I will answer each of his questions separately, numbering them to correspond to his own numeration.

1. There is considerable difference in the amount of roving wound on the bobbin, when run on a bobbin leading frame as against a bobbin run on the flyer lead. A bobbin lead frame will put on an appreciable amount more roving on the bobbin than the flyer lead will. "Wash" seems to think it was this fact that caused the universal adoption of the bobbin lead in preference to the older flyer lead. That is not so. The change was made because it was found that the speeders could be operated better when run so as to make the piecing up right hand. It was also desirable to run right hand twist on all frames. Only a bobbin leading frame can combine these two advantages. There are several other advantages, which I explained on page 471 of the March, 1926, issue. However, through a little misunderstanding, my signature was not attached to it. I should like to take this opportunity to claim credit, favorable or otherwise, for that letter.

2. I cannot agree with "Wash" that a flyer lead frame will run lower grade stock than a bobbin lead frame, because I have seen some very poor stuff run successfully on the bobbin lead. I have also seen some very pretty roving made on the bobbin lead. If you know a speeder you can get results.

3. The bobbin lead makes a firmer bobbin than the flyer lead, because the spindle speed is higher on the bobbin lead frame. The higher spindle speed causes the presser to exert greater pressure on the bobbin, making a firmer bobbin naturally.

4. I might add that it is impractical to run a flyer lead frame as fast as the bobbin lead, because the bobbin on a flyer lead travels fastest when full, and this fact places a lower limit of spindle speed on the flyer lead. The bobbin lead has the most pressure at the termination of the presser pad, as "Wash" likes to express it. I explained in question 3, just why that is so. If the pressure were detrimental, as "Wash" says it is, we have men in the shops who are equal to the task of reducing it. We want this extra pressure. It builds a better bobbin, and we get a longer length of roving on the bobbin.

5. When "Wash" claims the method of winding on the flyer lead causes less stretch than on the bobbin lead due to drawing the roving past the point of pressure in one case and laying the roving on in the other, he is indulging in day dreams, in my opinion.

While the bobbin does draw the roving from under the presser on the bobbin lead, the flyer drags the roving over the bobbin on the flyer lead. Not really much difference when we come right down to brass tacks.

Speaking of roving running out unevenly, suppose we have an extra layer on some bobbins. Figure the percentage of this, against the total yardage on the full bobbin. Nothing really alarming, after all.

Although I have read after "Wash" for a long time,

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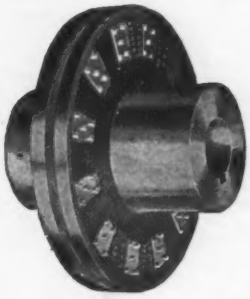

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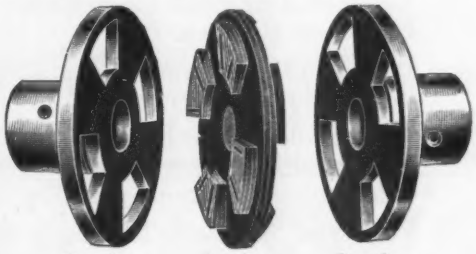

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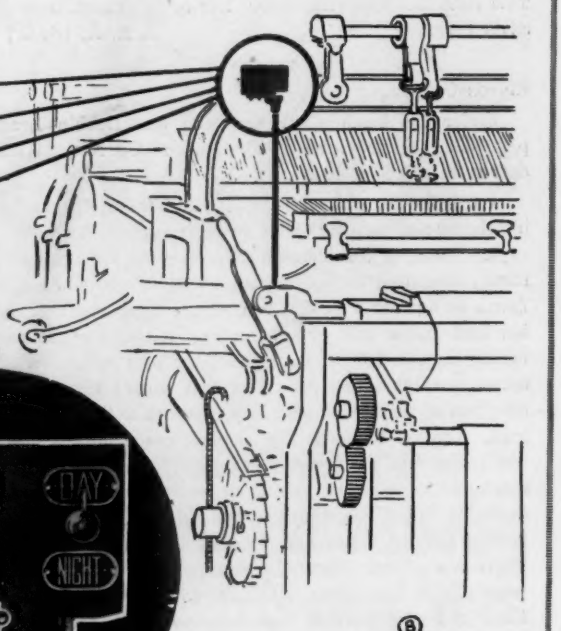

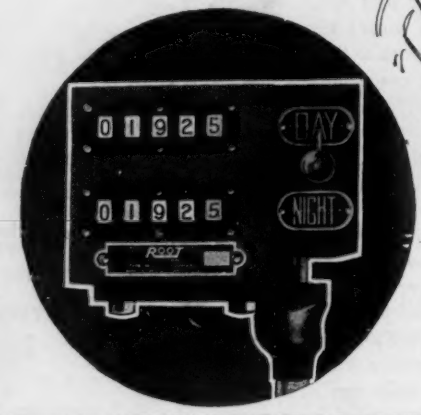

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I still don't just grasp what he means by his "unequal conditions." Perhaps it is like an electric current, "Wash" can feel it in his bones but is unable to define it.

C. C. (N. J.)

Cork Rolls and Winding Motions

EDITOR COTTON:

I have been hoping that this subject of cork rolls would be continued a little further by some of our friends since my few remarks were published in the March issue of COTTON, and to my satisfaction I find in the June issue a letter from "Wash (R. I.)" who no doubt is a champion of the cork covering for drafting rolls.

Well, it seems impossible to try to convert "Wash" to the belief that cork rolls which have been in use for several years are no better aid in the performance of correct drafting than are the leather covered rolls. However, in my letter in the March number of COTTON, my line of antagonism lay chiefly and directly towards one point, and that in the statement made by "Wash" in a recent issue, namely, that "over drafting shortens the strand in process," which statement set my ideas at variance with "Wash" on the subject.

Furtherwore, I still maintain that attitude simply to ascertain the correct answer to the question of whether a strand or roving in process, passing through a series of properly spaced and weighted rolls in an uneven condition is longer when delivered than one which is passing through the same rolls in an even condition.

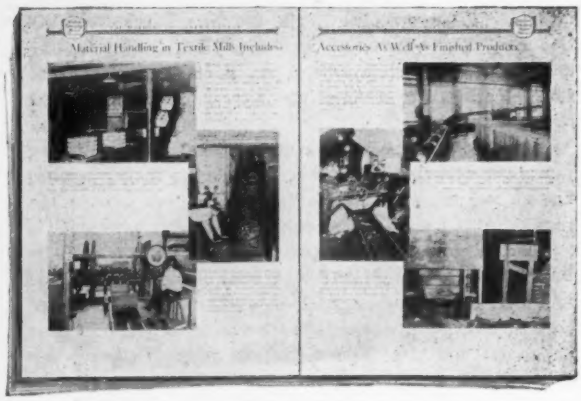
If we take "Wash's" statement to be correct, we have to believe that a length of roving or yarn which is delivered evenly and which has the standard turns per inch, is equal in length to another uneven roving or yarn passing through the same rolls, which cannot possess the standard turns in every inch delivered.

That was the reason why I asked "Wash" in my article in the March issue if he had ever noticed an uneven roving being delivered on any fly frame through any common cause without mentioning the nuisance of friction on the leather roll. Then I asked if such a roving would tighten up or sag somewhat or more often break.

In answering this question "Wash", in the June issue, informs me that frictional contact is not taken into account, still, he says "over-drafting causes uneven work, and where there is over-drafting there is also increased frictional contact."

However, his answer to my question does not fit in, because I only mentioned the case of a roving being delivered not being wound on the bobbin, and "Wash" must know that uneven roving is made before reaching the flyer-presser, and that is why I asked him to perform the so-called absurd operation of trying to put twist into the roving with the human hand, mind you, not the standard turns per inch, as "Wash" seems to think I wanted him to do, but just to take up an end and put the possible twist in with the hands. This is the condition of an unevenly delivered roving which cannot be equal in length to the evenly delivered and properly twisted roving, in fact, as is very plainly seen, the uneven roving is longer.

I still fail to see how this over-drafting shortens the strand in process, and also how cork rolls claim superiority to leather covered rolls. After reading in the June issue of COTTON a few remarks which were made by one or two



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members of the Eastern North Carolina Division of the Southern Textile Association at their first meeting, on the qualities, etc., of cork rolls, I am inclined to think that some others fail to see that the latter have any advantage over the leather rolls.

I noticed that one member at the meeting said that they ran about as well as leather rolls and gave longer service, but he did not mention that good work was always the result. Also I noticed that one member must have made a mistake, according to a recent statement by "Wash", as this member declared that cork rolls do groove and the rolls had to be sand-papered, so another so-called advantage of these rolls does not reach our expectations. They do groove and also flute when left weighted during any extra shut-down, when frames are stopped, just like the leather rolls will do. However, "Wash" says his rolls are covered with a new process of cork-covering. I am inclined to think that I am familiar with this same kind of process, and I am of the opinion that the cork covered surface of any drafting-roll cannot be claimed as an advantage over the leather roll with the cushion effect of the flannel on which the leather is fitted, in the production of even yarn.

There is another little point in "Wash's" article which has set me thinking that perhaps he must have made some mistake where, in his description of the term over-drafting he claims that "properly spaced and properly weighted rolls will cause intermittent action, which will in turn cause light and heavy places," which means that if we set our drafting rolls properly and weight properly we get bad work as a result. "Wash" surely has gone astray on drafting, and as this department is solely established as a means of we mill fellows offering suggestions, I am always trying to find a way or means by which I can pass something good on to my friends in our discussion department, and here I point out to our friend "Wash" that in his letter in the December issue of COTTON he made a serious mistake, as many other mill men do, when he stated that: "On a speeder the surface speed of the front roll and the excess surface speed of the bobbin over the flyer should be equal, or the bobbin must be made to retard so that its surface speed will be equal to the surface speed of the front roll."

I would like to inform "Wash" that the foregoing statement is not true, and it is very misleading to young speeder men, and to prove that "Wash" has perhaps slipped on this point I will do a little calculation, and the value of same is seen in the truth that many men really believe that the surface speeds of the bobbin must remain the same all through the set in order to maintain equal winding on owing to equal delivery from the rollers. As I said previously, this is wrong, so now for the calculation, which will show that the surface speeds of the bobbins calculated only from excess revolutions of bobbins must be always equal.

We will assume an empty bobbin to be 1.5-inches in diameter and a full bobbin to be 6 inches in diameter, spindle revolutions 1000 per minute, bobbins 1030 when full and therefore 1120 per minute when empty. Our object is to find surface speeds of full and empty bobbins respectively, and we proceed thus:

Full bobbin $\frac{1030 \times 6 \times 22}{12 \times 7} = 1618.5$ feet per minute surface speed.

Empty bobbin $\frac{1120 \times 1.5 \times 22}{12 \times 7} = 440$ feet per minute surface speed.

Now divide 1618.5 by 440 and we get 3.67 and that means the surface speed of the full bobbin is 3.67 times as great as that of the empty bobbin taking near correct working conditions with a high spindle speed.

From the foregoing dimensions we will prove what I stated about the surface speeds of bobbins calculated only from excess revolutions of bobbins must remain equal always. Hence:

$$\frac{30 \times 6 \times 22}{12 \times 7} = \frac{120 \times 1.5 \times 22}{12 \times 7}$$

which equals 47 1/7 feet excess surface speed in each case.

It must be understood that in this connection we get an unwinding action of the flyer, which prevents the winding on of one coil of roving for every revolution it makes in putting twist into it, and it is necessary to run bobbins and spindles at such a speed in order to accomplish twisting, and we depend upon the difference in speed for winding on.

I hope I have made this point clear, as I know many men do not thoroughly understand the point, and the statement made by "Wash" regarding this matter has probably given some other fellow a chance to know the truth concerning it or at least to launch forth an argument as to its solidity.

However, I did not intend mentioning the matter in this letter, but on noticing the fact that "Wash'" had referred to it in his letter on cork rolls and over-drafting I decided that I was in order, and so in conclusion I must admit that after all the claims of lasting service attributed to cork rolls I still prefer using the leather roll until somebody places one better on the market.

CONTRIBUTOR NO. 4362.

Needs a Properly Trained "Watch Dog."

EDITOR COTTON:

I have just finished reading, in the July issue of COTTON, an installment of "Old Timer's" story of his trip through Jim's mill. His trip, and the way he tells about it, is the most interesting thing I have read in some time—especially the part about warp preparation, as I have been thinking a whole lot along this line.

I have always considered the spooler, warper and slasher as the three most important units in the manufacture of cloth, and I have often noted that they are the most neglected and abused links in the whole chain. It seems strange to me that a superintendent, seemingly up-to-date and fully competent, will spend a lot of his time in the cloth room, watching seconds pile up and production go down, cussing the boss weaver and the cloth room overseer for something for which they really aren't to blame. Why doesn't he go to the slasher room and stand in front of the slashers, where he can see the cause of 95 per cent of the imperfections in the cloth and the causes of low production. But, instead of investigating these things, he generally informs the boss weaver that he must lower the seconds, and increase the production.

Spoolers are neglected, the guides are left open, knots and gouts of all kinds and sizes pass through, ends are lapped on the spools, the warper tender gets careless and doesn't adjust the combs properly, causing high and low selvages, loose ends come and go.

The slasher man sits around and talks, leaving the ma-

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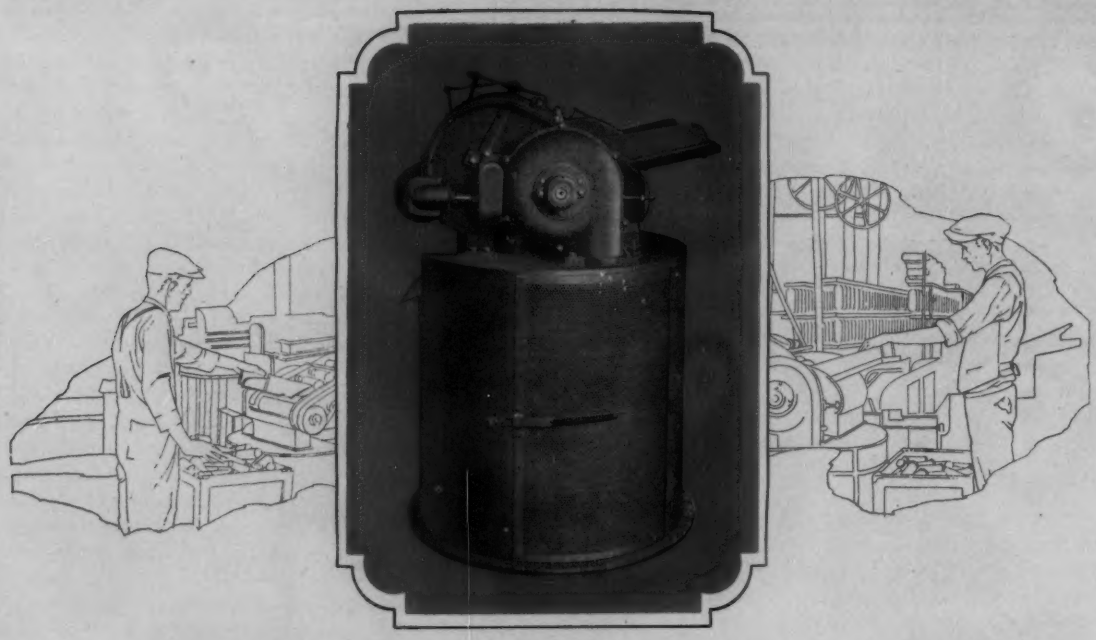

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chines to run themselves, as he figures that he is being paid just enough to doff the warps. The size is improperly cooked and is allowed to get too low and cold in the size vat. The tension on the beams is neglected, the warps are not properly leased and are run too wet.

Consequently, the weave room is filled with loose ends, gouts, knots, tail ends, drawbacks, cut selvages, and hard and soft warps. The weavers realize they can't get production, or make good cloth, and quit trying. Production runs lower and lower and seconds higher. The superintendent does some more fancy cussing, the boss weaver becomes discouraged and begins to look for another job, and matters go from bad to worse. Then maybe the boss weaver gets his time and if so, who was to blame.

I am looking forward to the day when the August number of COTTON arrives for I am guessing "Old Timer" will get to the weave room in Jim's mill by then.

I agree with a previous writer in these columns. I think we need a "watch dog" in the mills, but not just to watch the boss weaver.

CONTRIBUTOR No. 268.

Uneven Tension on Fly Frames.

EDITOR COTTON:

"Contributor No. 4319" states in the last paragraph of his article entitled "Uneven Tension on Fly Frames," appearing in the April issue of COTTON, "When changing from 1.00 to 1.35 hank roving, I do not have to change the cone gear on the *B* frames, but do have to change the take-up on the *A* frames." This contributor must be confused a bit.

When the cone gear is changed it is done to position the belt on different intermediate speeds. In other words, if the cone belt is 4 inches from the beginning of the set the cone gear can be changed to position the cone belt at the extreme end of the bottom cone. When we speak of take-up, we mean the rack or tension gear. Now which is which?

On any fly frame where conditions differ, the trouble is in the train of gears to the compound, or in the outline of the cones. "Contributor No. 4319" should examine the compound pinions on each frame. Please do not misunderstand me, what I mean by the compound pinion is the gear that meshes with the sun gear.

If the trouble is in the outline of the cones, new ones should be purchased. WASH (R. I.)

Little Things That Even Up the Work.

EDITOR COTTON:

Referring to the March issue of COTTON, will say that I have read over the article on the control of cloth weights some two or three times, and I consider this of sufficient value to be read the second time by every subscriber; it brings to my mind some of the biggest "little things" that a lot of us fellows have winked at so many times, letting our numbers get away from us—wide variation in our numbers—light and heavy drawing, roving yarns, the cloth, yes, and the overseer's pocket book got light, but as for himself, he got heavy.

Writing these practical letters has done me more good than a year of hard work hunting the "little things" trying to make an improvement in my work. Some one might say, "Oh, I don't see so much in hunting for these little things all the time," but listen at this—I am making this statement after reading the letter on page 455 of the March issue of COTTON—I begin to think of the several hundred little old things that would cause the card sliver to vary anywhere from one to four grains. I then begin to figure just how much this would change the number of the yarn. It is true we have doublings, and I want to say right here, it's a darn good thing we have, for if we did not have them to help us out we would be spinning 30s sometimes on the same side of the spinning frame that is supposed to be spinning 20s.

The other day I began to hunt for variation. I could trace it in every angle. I spent the day sizing. I let the job of looking after boozers and big things go. I am starting up a new job of carding and spinning on 20s warp and 14s filling. I only have 21 of my cards running; the fitters are still here, so when I got back to the cards, in sizing up, I found in my card sliver anywhere from two to five grains variation. Someone is going to say, "Well, that doesn't amount to much. I have seen that day in and day out." So have I, and I thought "Oh well, it isn't so bad. The doublings will catch this." But I want to say right here that all the hot air and humidity and regain and such like will not remedy this, and sometimes the doublings makes this thing still lighter of a greater variation. Suppose we happen to get several of those light slivers hitting together in those doublings, which will be sure to happen occasionally, then our humidity isn't going to even it over. Tension gears will certainly not catch it.

Our twist gears do not suit this hank roving and we are trying to run two different hank rovings on the same frame and trying to concentrate it with one cone gear as it is wound on the bobbin and when that last longer draft in the spinning room gets it in the creel, the traveler is entirely too light for it. Now let's just think for a moment right here. Suppose the spoons on the back of those drawing frames are not stopping the frames just right; suppose that frame hand gets several of those cans in the back of his slubber; the boss is not around; the second hand is hustling around in some other part of the mill and the frame fixer is busy, no doubt changing tension gears somewhere under those conditions, and the slubber hand is naturally on piece work, so he steps up and knocks this slubber off and winds his rack back a little. It is too far, for his convenience, to hunt up the fixer. If he did do it and found the fixer and told him the ends were too slack and the fixer changed the gear, this still would not remedy it. It would only make matters worse.

I have run a job this way and don't deny it, and I know that there are others who have done the same thing. Oh well, what did you do to remedy that variation? All the cards were new and all set with the same setting; all were throwing out the same percentage of strips and card fly; all had on the same gears all around and all the card clothing was new; all the card wire the same length and bound to be holding the stock all alike. Now how in Sam Hill can this get this way. I will tell you:

That big old picker sitting out in the picker room is as big as an old elephant and figuratively speaking, as full of fleas, which are just as troublesome as those of the hard-bodied, bloodsucking variety of insects found on the anatomy of the aforesaid elephant, and if not exterminated will torment one to death. I have found one of these same fleas, with their well known propensity for jumping, throughout

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the entire mill. They got into the cotton, the pieces being so large and the fleas so little, they were hid from sight, but as soon as the cotton got small enough up there in the spinning room they hopped out and I got after them and ran them clear back to the picker room. There I proceeded to get some flea killer, beginning right at the hopper—I have a breaker picker with two hoppers, the first hopper sitting right under the overhead condenser. This cotton falls from the condenser direct into the hopper. On the side of this machine I have a belt evener control that shifts off and on and starts and stops the back apron and is supposed to keep the second hopper up to a certain level so that the spike apron of the second hopper would give a certain amount over to the first beater. Right here are the weights that control the counter balance for shifting off and on of the back feed apron. This weight was so heavy that the counter balance door in the hopper was almost the same weight. This weight and the other counter balance weights and the door in the hopper that controls as the cotton gets high or low in the hopper were all too near the same weight which would allow the second hopper to either run too full before it would operate the shifter to stop or the hopper would run too low before it would operate the shifter to start up again.

These weights were supposed to be the standard weights used, and as soon as I found the trouble I took off weights on the bar that pulls the belt on the loose pulley and made some weights to operate when the hopper ran down a little bit and would work the shifter back when that little bit fed out. In this way I secured a very nearly perfect feed. I then took in all beater and fan speeds and all speeds in the entire room and began to set them and change things to make as clean, even laps as possible. I went over all working parts of the finisher and eveners and got them as sensitive as I could and I got the breaker laps to weighing 19 ounces per yard. I unrolled several laps across the room on the floor and measured them with a steel tape for yardage. I then took the yard square and took as many yards out of the unrolled laps as I could get, yard after yard and examined it before a window where I could look through it at the light. I got every yard to where it would weigh within—well you might say 19 ounces. By experimenting with the hopper I made some laps and put them on the finisher.

After going over the evener and speeds and settings I put the flea killer to the finisher under the same test. I ran the finisher right with my picker man on every lap, and that machine ran 51 laps, all weighing within a range of ⅛ of a pound variation and I haven't lost a lap yet.

Dont' boo at this; it's being done every day right here. This might help some one on this type of machine if they are having trouble and will lose sight of the big things and go after those darn little old "fleas." Our trouble is right here on those pickers. The shops have never yet built a perfect picker, so we should go after the picker room and then size cloth and yarn. J. F. L. (ALA.)

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Fly Frames and Their Faults.

EDITOR COTTON:

In the March issue of COTTON I noticed an article entitled "Thinks Bobbin Lead Fly Frames Better." This subject is getting voluminous, but it is not my fault, for the subject is started every little while by the defenders of the bobbin-lead that think they understand both systems.

Paragraph 3 is where this writer turns to the left instead of the right. He states: "To begin with, the train of gears driving the bobbin shaft contains more gears than there are in the spindle shaft drive."

He should be reminded that we are not going back to the old Brown and Lowell single row frames. There is no difference in the train of gears on any of the modern fly frames. The only difference is that the compound pinion on the flyer-lead is on the opposite side of the sun wheel so as to drive opposite to that of the bobbin-lead system. Again in this paragraph he states, "This will naturally result in the bobbin lagging behind slightly when the frame is started up." He seems to forget that the slower the bottom cone revolves the slacker the tension; therefore, any back lash or any slight retard of the bobbin would cause slack. I hope the following will be clipped by those interested so I will not be obliged to repeat, thus saving space.

In the flyer-lead system, at doffing, we raise the bottom cone the same as in the bobbin-lead system. In the flyer-lead system when the cone is raised the bobbin speed is increased to equal the speed of the spindle known as the equal speed. When the bottom cone is raised on the bobbin-lead frame, the bobbin speed is decreased to that of the spindle and we have the equal speed. In the flyer-lead system the excess speed is obtained by the bottom cone taking away a proper amount of turns from the bobbin. In the bobbin-lead system the excess speed is obtained by the bottom cone driving the bobbin in excess of the spindle speed at all times during the winding. So, it should be clear that the only way to strain the ends with the flyer-lead system is to increase the speed of the bottom cone.

In the 4th paragraph he states, "Another thing in favor of the bobbin lead is that the bobbins run at their highest velocity when they are empty; whereas, in the flyer-lead frame the bobbins are traveling fastest when full. This condition it seems to me, would tend to increase vibration in the spindles, causing excessive wear on spindle bolsters and spindle steps."

That is sound reasoning, but he seems to forget that when we state the bobbin leads, we mean that the bobbin is traveling at a higher rate of speed than the spindle during winding, so if there is any vibration in the spindle bolsters and spindle steps, it happens on the bobbin-lead frame.

With the flyer lead conditions are reversed. When we state the flyer leads, we mean that the flyer is leading the bobbin at all times during winding. The speed of the bobbin is slower at all times than that of the spindle during winding, which means less vibration.

Another point here is, as the flyer travels faster than the bobbin at all times, it has a tendency to take the bobbin around with it, which is a good aid to the cone bolt.

The paragraph asking, "Can any advantage in favor of

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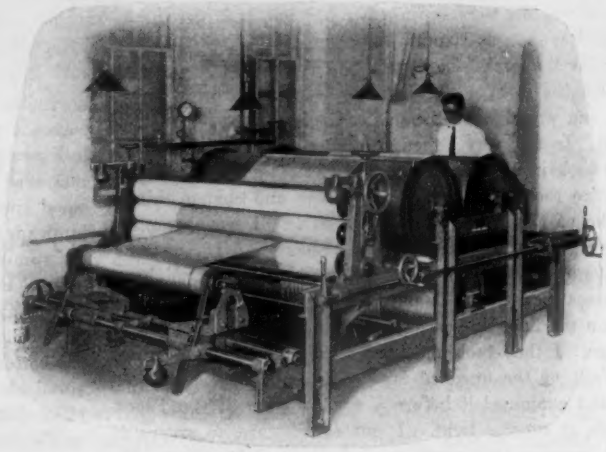

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RAYON
The Most Popular Product in the World Today

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SPECIAL DEVICES for Knitting Machines.
CONDITIONERS for the yarn which eliminate the use of oil entirely and give a better fabric.
DYEING AND FINISHING MACHINES.
WINDING MACHINES equipped with an Automatic Builder mechanically thrown in and out of action which gives perfect winding.

I know you are anxious to improve your product and decrease the cost. Why not write and give me an opportunity to explain my equipment?

OTHER PRODUCTS—Cloth Cutting, Folding and Winding Machines; Pipe Loading and Turning Machine; Cloth Turning Machine; Paraffine Device; Button and Button Hole Spacers; Band Cutting and Folding Machine; Neck Marking Machine; Vertical Drying Machine; Oiling Device for Spring Needles; Shrinking, Steaming and Pressing Machine. Also design special machines on request.

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Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks. Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

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99 Beekman Street NEW YORK

the flyer-lead be shown here?" Well, a few have already been given, with more to follow.

Again, in paragraph 5, he says, "'Wash' states that on a bobbin-lead frame the stretch is caused by drawing the strand of roving under the presser pad. It is easy to make a statement. The hard part is to prove conclusively the truth of that statement."

Well, here it is: All roving delivered by the front rolls must pass the termination of the presser pad and a great amount of pressure exists at this point when the frame is up to speed. Therefore, if 20 inches is delivered by the front rolls, the surface of the bobbin must move 20 inches and pass the eye of the paddle in order to wind-on, because the winding is done by the bobbin, having an excess speed to that of the flyer. Now stop and think what a load the cone belt is called upon to drive. The reason for the special cone belting.

Now, compare the flyer-lead in this respect and we find that when the front rolls deliver 20 inches the eye of the presser must be made to move a distance of 20 inches over the surface of the bobbin. Now please note the difference between the two systems at this point.

The pressure is greater on the bobbin-lead system, because the presser points in the direction it revolves, while on the flyer-lead the presser points opposite to that of the speed of the spindle. Again, granted that the pressure was equal at this point, the flyer-lead has the advantage, for the reason that the bottom cone in taking away so many revolutions causes the presser pad to gracefully glide over the surface of the bobbin as if laid by the human hand.

If any reader of COTTON wishes any more proof about the bobbin-lead being defective, let them make the following test: Doff an intermediate frame. Next, creel all the roving in the same rows on the fine speeder so that the stretch will be equal. Use new skewers if possible. After the test please write and let me know if the bobbin lead frame is perfect. It will be found that some of the roving will be running out, while on others will be found at least a layer or more. Now be honest and let us see if this stretch is caused by the creel as claimed in the 5th paragraph of the letter we are discussing.

In the 8th paragraph he suggests that I take a ride on a merry-go-round, then ask myself, "How far did I get?" Well, it is rather cold in Rhode Island as I write to take such a ride, but even if I did I would still know that I understand the two systems and feel qualified to write on the subject.

When the bottom cone on any flyer-lead frame is raised do the ends fly out of the hollow leg? Of course not. When an end breaks on either system, the end will curl at the top of the flyer, simply because it is disconnected from the surface speed of the bobbin.

In the 9th paragraph, like all other defenders of the bobbin-lead, he too is forced to admit that the fly frame is far from perfection. That is only what I claimed since first writing for COTTON 13 years ago, that the fly frame is far from being perfect, so I have another convert.

This correspondent gets practical in the last paragraph. He states, "There is nothing impossible, and sooner or later someone will come along and devise better and more suitable methods of handling the roving. The evils of the modern roving frame can and will be lessened, if not entirely eliminated, but I do not think it will come about by the readoption of the flyer-lead."

For SILK—RAYON and fine COTTON

BECo

Whenever you buy Winding and Warping Machinery, be sure it carries this symbol: indicative of mechanical excellence. . . .

BENJAMIN EASTWOOD CO.
Paterson, N. J.

Represented in the South by
FRED H. WHITE, Charlotte, N. C.

DIXON'S
SILICA-GRAPHITE
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because of its better protective qualities, makes frequent repairing unnecessary and so gives better protection at less cost.
It is a natural combination of flake silica-graphite, mined only by ourselves. The vehicle is the best linseed oil obtainable.
Dixon's Silica-Graphite Paint will not peel, crack or flake off because of the natural elasticity of the flake graphite, while the silica is an anchor that withstands wear.
It is made from FIRST QUALITY only with a reputation for economy covering a period of 50 years.
Write for Booklet No. 34-B and long service records.
JOSEPH DIXON CRUCIBLE CO.
Jersey City, N. J.
Established 1827
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SILICA-GRAPHITE PAINT
FOUR COLORS
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selling direct or through agents can use the services of this Bank to enable them to distribute their merchandise for cash—and thereby eliminate the credit risk.

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Make it fire proof!
Rugged Strength! Yes! And you can make it absolutely fireproof, too, by using
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This ideal concrete "aggregate" combines this security with unusual strength—for it is produced at 2800 degrees and is itself fireproof.
Photo shows B'ham Post Bldg.
BIRMINGHAM SLAG CO.
Slag Headquarters for the South
ATLANTA
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Winter is too short to allow much time for planning next summer's beauty of

Trees and Flowering Shrubs

Late winter and early spring are the time to plant, in order that young nursery stock may establish itself before hot weather.

Now is the time to consider what material you need, and how it shall be disposed. Now is the time to plan for the permanent enrichment of your home by means of trees and shrubs.

Let our representative call upon you at an early date. He can advise and assist you in choosing the most suitable plants. We will attend to the actual planting if you want us to.

THE HOWARD-HICKORY CO.

Nurserymen and Landscape Gardeners

Hickory, N. C.

RAYON SIZING FOR WARP

SKEIN OR SLASHER

ALL sizings bind the fibres, but if you wish to obtain in your Warp Ends, the two most essential characteristics, *Elasticity and Flexibility, you must use*

WASOL M-21

DISCHARGES IN PLAIN WATER

Neutrasol Products Company

41 Park Row New York

At the beginning of his letter he claims much for the bobbin-lead, and terminates it by admitting what it really is—a failure for perfect winding. However, he is dead right, for there was a patent granted June 30, 1925, that overcomes all unequal conditions on fly frames, for the reason that the driving shaft drives both spindles and bobbins during winding. So the flyer-lead will never come back.

WASH (R. I.)

Twist In Roving

EDITOR COTTON:

Hoping that I can be of some help to "C. S. F. (Ala.)" concerning his question printed in the May issue, I am submitting the following:

If the twist per inch were the same on both the hard and soft bobbins, no difference would exist in the drafting of this roving.

The difference in the density of the bobbin he speaks of would be due to no defect in the roving itself, such as overdrafting, tension, etc. The probable cause would be a difference in speed between the two frames, causing the presser to exert more pressure on one frame than on the other.

Different makes of frames will also produce bobbins of different density, but the roving will draw equally well with that of another make of frame.

C. C. (MASS.)

Mill Men Help Machinery Builders.

EDITOR COTTON:

I was greatly interested in the article in January COTTON entitled "Uneven Tension and Some Other Things," by "Contributor No. 4309. In the third paragraph of his letter this contributor states "This frame was put out by the manufacturer to run right, and there are but few overseers that can dictate to a shop how their machines should be built." If he will give me his address I will name him the man who called on me a few weeks ago to have me try out new flyers before they were turned out from the shop. The man in question represents one of the largest shops building fly frames. Again, I was one of the many who discouraged the chain idea instead of a horse-head. This was tried out by the writer in a New York cotton mill where he was superintendent. I could go on and name many other such cases. Builders have men on the road continually looking for information and new ideas, and they succeed in spots and turn this in to the experimenting department.

Furthermore, I can name the agent of one of the largest shops building fly frames who made the following statement to me: "The 'How Other Men Manage' department makes COTTON without doubt the greatest textile paper. We get many new ideas from the contributors to this department, and some we have tried out." He then pointed to a new style of covering on the head end of the frame. The foregoing will prove itself when this new frame is on the market. Is it not a fact that most men found at the helm of our shops building fly frames or other textile machinery were formerly overseers or superintendents?

In the fourth paragraph, "Contributor No. 4309" talks about inventing a constant. The readers of this department know that this is impossible. If such is used, the results will be wrong. Most all overseers have catalogs containing them. Every overseer knows that draft is the

All Steel Schick Fireproof

Unexcelled for Baling Cotton

Economical, efficient baling of cotton, waste paper, rags, ravellings and other scrap materials, is easily accomplished with a Schick Baler. These powerful presses are made in 8 convenient sizes; Hand-balers 125 to 375 lbs.; Power-balers, 350 lbs. to 1500 lbs. capacity. Schick balers are all-steel, fireproof and positive in operation. There is one to meet your requirements.

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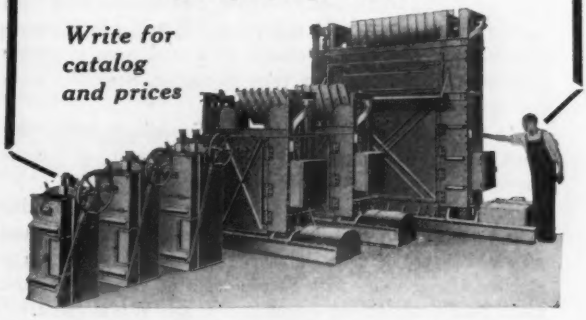
Write for catalog and prices



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A Fine Looking Loom

Harness of Great Durability

We believe that no more attractive looking harness is made than those which we are turning out right along. The harness looks smooth and feels smooth. The eyes are of just the right size, in perfect alignment and are open just enough to draw in well. The harnesses not only look well but they weave well and wear well.

Will you write for full description?

TRADE MARK

GARLAND MFG. CO.

SACO, MAINE

surface speed of the front or the delivery roll divided by the surface speed of the back roll or the number of inches delivered in a certain time divided by the number of inches fed. We know that draft is equal to the hank coming out divided by the hank going in. Again, draft is equal to the weight per yard going in divided by the weight per yard coming out. Then why invent a constant dividend?

As regards the "big fellow" in the office ordering extra twist in the roving or yarn, this is something I never experienced, and I have been overseer and superintendent for over 30 years. The "big fellow" wants the twist out, for two reasons. It makes a softer finished cloth, and it means a larger production. Many able overseers have lost their job through conceiving the idea that the "big fellow" in the office did not know his business. The "big fellow" is a big fellow because he knows his business; if he did not, he would not be at the helm.

What "Contributor No. 4309" states in the eleventh paragraph is an impossibility. Put fifteen teeth of extra twist over standard on any slubber, and the drawing rolls on the intermediates will not draw. Try it. It is inconceivable that any man in charge of a card room is unable to detect fifteen teeth extra twist in roving, especially slubber roving.

In the next paragraph he states, "Sometimes, being very short tempered, I almost boil over when something like the above is brought to my attention."

I am not short tempered, but from the tone of this article it is plain that I am going crazy with heat—and why? Because a man in charge of a card room ran a slubber fifteen years with fifteen teeth of extra twist, and in all that time did not detect it. WASH (R. I.)

A Picker Room Kink.

EDITOR COTTON:

The other day I was in the picker room looking around to see what I could see—as superintendents do sometimes—and I noticed a lapper hand putting up a fresh lap where one had run out, and he doubled it too much, on the apron, and I noticed that the evener motion was working vigorously, and that the cone or roller that was swinging, as we have our pickers equipped with the Corn swinging idler, was traveling at a high speed, and being worn at the bearings, was vibrating excessively. I figured out that when the belt was on the small end of this cone, to take care of a thick place, and this vibration resulted, it affected the apron, also.

I had one of the men take this cone out for the bearings to be put into shape. When he did this, he replaced it with an extra roller we had on hand. This was a straight roller, not cone-shaped, and was about 3½ inches in diameter. It weighed about fifteen pounds, I think, and was about the size of the plain outside roller on the Kitson picker evener at the outside of the top stand. I did not notice this for a while, and one day I saw he was still using this straight roller on the Corn swinging idler instead of a cone. He told me it had been running so smoothly he had not wanted to change. This seemed to eliminate practically all of the vibration when taking care of a thick place. We have not tested it for breaking strength to see the result there, but we do feel quite sure that we have had some smoother and more even laps, and the finisher man says he has less trouble with lap variation, and his machines run steadier than ever before. T. A. D. (GA.)

Chemists and Colorists to Meet.

An event of more than ordinary interest to the textile industry in the South will be the annual meeting of the American Association of Textile Chemists and Colorists in Charlotte, N. C., on the third and fourth of December of this year.

The membership of this Association represents almost the entire color producing and textile color consuming industries in this country, while the organization ranks high among the technical associations of America. It was formed to promote knowledge of the application of dyes and chemicals in the textile industry, to encourage research work in this respect, and establish channels for the interchange of knowledge among its members.

The Association is today recognized by both the color consuming industry and the Government as being a most powerful agency in the promotion of the art and science of textile coloring and finishing, and is properly expected to maintain and strengthen the leadership that American textiles have assumed in the markets of the world, on account of their superior coloring and finish.

The program of this meeting provides for a number of side trips to important textile plants in Greensboro, Salisbury, in and about Charlotte, Gaston County points, and in and about Spartanburg and Greenville, S. C. An informal smoker, with suitable entertainment, will be provided by the local Arrangements Committee for Friday evening. Saturday will be devoted to the reading and discussion of important papers relating to the industry. The annual banquet will be held on Saturday evening; a large attendance is expected from both North and South.

Many of the speakers for this event are nationally known men who are recognized leaders in their particular fields, and will include Prof. Louis A. Olney, of Lowell, Mass., President of the Association; Edwin Farnham Greene, of Boston; Colonel H. A. Metz, of New York City; and Dr. D. W. Daniel.

STATEMENT

of the ownership, management, circulation, etc., required by the act of Congress of August 24, 1912, of COTTON, published monthly at Dalton, Ga., for October 1st, 1926.

State of Georgia, County of Fulton.

Before me, a Notary Public, in and for the State and County aforesaid, personally appeared W. J. Rooke, who, having been duly sworn according to law, deposes and says that he is the Business Manager of COTTON, and that the following is to the best of his knowledge and belief, a true statement for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, W. R. C. Smith Publishing Co., Atlanta, Ga.; Editor, L. L. Arnold, Atlanta, Ga.; Business Manager, W. J. Rooke, Atlanta, Ga.

2. That the owners are: W. R. C. Smith, Atlanta, Ga.; W. S. Cushion, Cleveland, Ohio; O. A. Sharpless, Atlanta, Ga.; J. C. Martin, Atlanta, Ga.; H. H. Kelley, Atlanta, Ga.; W. J Rooke, Atlanta, Ga.; T. W. McAllister, Atlanta, Ga.; W. O. Rogers, Atlanta, Ga.; P. D. Hammett, Chicago, Ill.; A. E. C. Smith, Cleveland, Ohio.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or any other security holders are. None.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs containing statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bonafide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. W. J. ROOKE, Bus. Mgr.

Sworn to and subscribed before me this 29th day of September, 1926.

(Seal) E. L. PHILPOT, Notary Public.

My commission expires March 18, 1927.

Knitting Section

Fancy Half Hose

B-Vertical Floating Striping Machine
B-Vertical Floating Striper and Dot Machine
***B-6 Machine**
***B-7 Machine**

THESE machines offer a variety of styles and colors to meet all demands.

Simple patterns may be produced on these machines as well as the more comprehensive styles containing a multiplicity of colors, checks, dots, etc., incorporating in one machine the advantages of all these desirable features.

*Models B-6 and B-7

These machines are built with six and seven yarn feeding fingers, respectively. These machines are of floating vertical stripe design.

The vertical stripes are produced by groups of knitting needles knitting with one or two yarns used for plaiting, thus producing a perfectly clear and positive vertical stripe of a greater width than can be produced with reverse plaiting needles, particularly when using worsteds or soft yarns on coarser gauges.

The vertical stripes can be located throughout the circumference of the stocking as desired, by the use of jacks under the needles to produce the vertical stripe of the width desired.

These machines will produce repeated horizontal stripe patterns of any design up to 48 courses, if two or more course width stripes are desired. Repeated patterns up to 24 courses can be made if single course stripes are incorporated in the pattern.

The vertical striping attachment on these machines is so arranged that when making plaids or checked patterns small squares can be inserted in the middle of the check or vertical stripe.

The above machines can be set up for either men's half hose or ladies' hose, if desired.

Established 1865

SCOTT & WILLIAMS

Incorporated

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NEW ENGLAND SPUN COTTON YARNS

We Spin Cotton Yarns in All Numbers from 1's to 100's.

We Twist these yarns in Any Number of Plys desired from 2 ply up.

We Furnish these single or twisted yarns to suit your own particular purpose. Any Twist you say.

We furnish them on Cones, Tubes, Spools, Bobbins, Warps, Beams, Skeins—Gassed or Ungassed.

We can furnish the above from any Staple Cotton you desire.

COMBED and CARDED AMERICAN or EGYPTIAN

and behind all this an Organization that has been Spinning Yarns for Years and Years.

We recommend

QUISSETT QUALITY YARNS

SPUN FROM

EARLY BLOOM COTTON

QUISSETT MILL

NEW BEDFORD, MASSACHUSETTS

80,000 SPINDLES

QUISSETT MEANS QUALITY

Sewing and Seaming Yarns for Knit Goods

BY WILLIAM DAVIS, M. A.

Every maker of knit goods who has to assemble garments for underwear or outerwear requires to use enormous quantities of sewing materials with which to join the various garment constituents. It is a matter of importance to choose the right materials calculated to do the operation required. In buying seaming and sewing materials, the requirements are quite different to other yarns in the hosiery trade and one has to ensure that the properties of tensile strength are adequate for such operations as sewing where a needle has to push its thread through, two layers of fabric at between 3,000 and 4,000 times per minute. In this process we require a thread which is of the utmost strength so as to withstand the severe jerks given to the thread, it should also be perfectly smooth and level in surface and be of the correct size. In this case the counts of the yarn have to correspond to the standard size

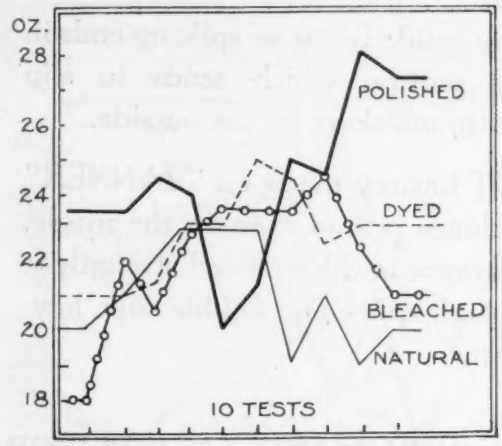


FIG 1

of the needle employed in the machine; if the counts are too thick then there will be friction in the needle eye.

For many grades of materials it is desirable to smooth the surface of the sewing cotton by means of wax or through the operation of polishing which is often conducted on a yarn in order to reduce the stretching property to a minimum and give an even yarn which will slip freely through the needle eye. Roundness is also very important and for this reason the rounder three or six fold yarns are preferred to the more cordy two-fold types. But there are other threads which do not require to pass through the fine needle eye but which are located in such members as loopers where the aperture is larger and allows of a freer movement of the sewing cotton. This thread is not pushed through the fabrics but is made to work with the needle thread on the lower side, or is placed around the edge of the seam to act as a means of obscuring the join. For functions of this nature thicker and softer yarns can be employed where their bulk is larger in proportion to their weight. In recent times, also, there has been a tendency for the covering thread in such a famous seam as the flatlock to be worked in some counts of artificial silk so that the raw edge of the two fabric pieces is not only obscured but a definitely ornamental appearance is also given to the seam.

To show the methods of testing such threads a number of trials have been made on a standard size of yarn used very largely in joining the more moderately priced grades of underwear. 40/3 cotton counts is a standard size used for general sewing purposes such as for the thread in the chain stitch machine, the lockstitch, and for basting purposes. The yarns are carded from American cotton and the ecru or unbleached types are used for natural colored underwear as this shade matches them most effectively. Large weights are also employed for white goods where the yarn is bleached. There are 22 turns per inch as stand-

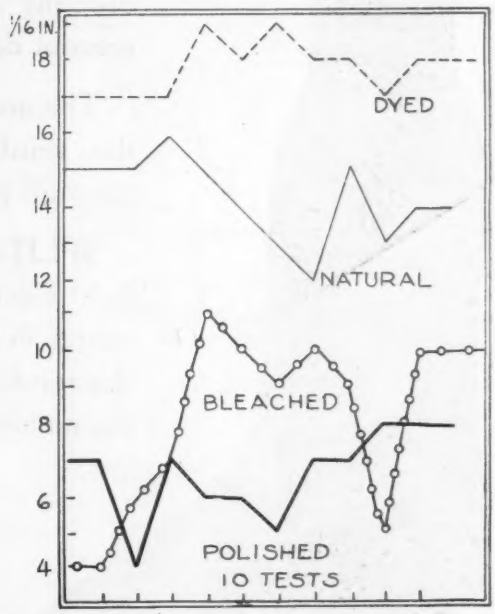


FIG 2

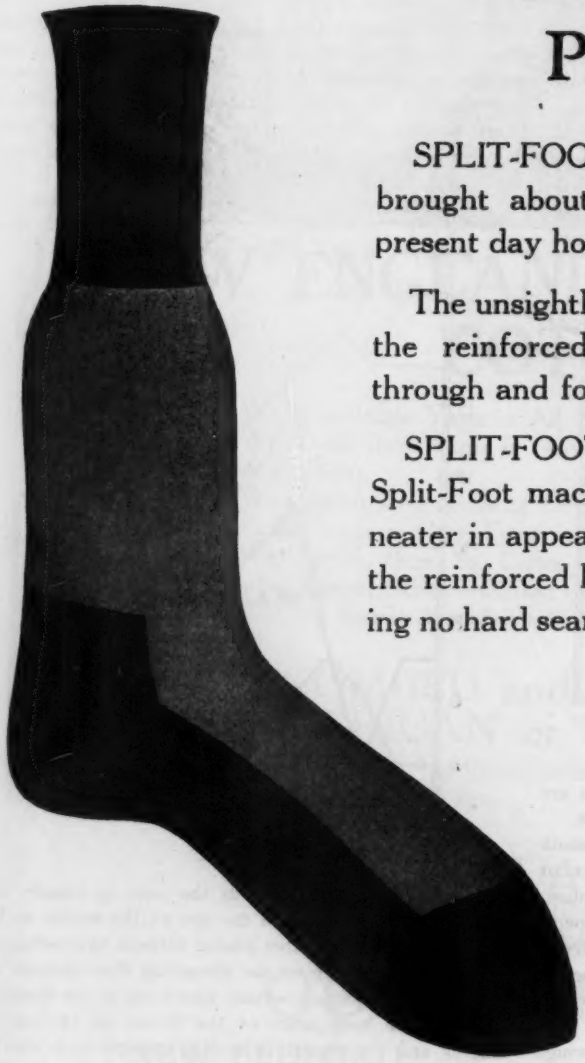
ard. For dark colored goods the yarn is usually dyed and for rapid working in the eye of the needle at high speeds, the thread is often passed between two surfaces of paraffin wax which gives the straggling fibers greater consistency and imparts a certain roundness to the thread.

Tests have been made of the thread in 18 inch test lengths and the results in tensile strength and elasticity are recorded for 10 successive measures of thread. There are five stages illustrated so that the alteration of the nature and properties of the yarn can be observed at each stage. The different classes treated are as follows: ecru or natural yarn, bleached, natural yarn waxed, yarn dyed black, dyed and waxed, and finally the results of polishing the thread are shown in the table. The four most important stages are also given in graph form in Figs. 1 and 2. The results of the 10 tests on 40/3 cotton counts sewing yarn, 22 turns per inch, 18 inch lengths on the Baer single thread testing machine follow:

Natural, 20, 21, 21.5, 23, 23, 23, 19, 21, 19, 20 ozs. =

The "BANNER"

SPLIT-FOOT PRODUCT



SPLIT-FOOT HOSIERY, the new creation, brought about by the main disadvantage in present day hosiery, namely:

The unsightly inside fringe of splicing ends in the reinforced portion which tends to slip through and form whiskers on the outside.

SPLIT-FOOT hosiery made on "BANNER" Split-Foot machines is smoother on the inside, neater in appearance and has added strength at the reinforced high splice and double sole, having no hard seams.

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WE INVITE INQUIRIES

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Main Office and Factory

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New York Sales and Show Rooms
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Southern Office,
James Bldg., Chattanooga, Tenn.

Philadelphia Sales and Show Rooms
Colonial Trust Bldg., 13th and Market Sts.

21.05 ounces average.

Bleached, 18.5, 22, 23, 19, 23, 23.5, 22.5, 19.5, 24, 21 = average 21.6 ounces.

Bleached and waxed, 25, 25, 26, 26, 28, 26, 17, 25, 26, 27 = 26 ounces average.

Dyed black, 21, 21, 21.5, 23, 23, 25, 24.5, 22.5, 23, 23 = 22.75 ounces average.

Bleached and polished, 24.5, 25.5, 24, 26, 29, 28, 31, 30, 26.5, 31 = 27.5 ounces average.

Similar tests for elongation on the foregoing yarns given in sixteenths of an inch are as follows:

Natural, 15, 15, 16, 15, 14, 13, 12, 15, 13, 14 = .8 inch average.

Bleached, 10, 14, 16, 12, 16, 16, 14, 14, 17, 15 = 9 inch average.

Bleached and waxed, 12, 12, 11, 12, 14, 12, 12, 12, 11, 12 = .75 inch average.

Dyed, 17, 17, 17, 19, 18, 19, 18, 18, 17, 18 = 1.125 inch average.

Dyed and waxed, 4, 6, 7, 11, 10, 9, 10, 9, 5, 10 = .5 inch average.

Bleached and polished, 7, 6, 6, 6, 7, 5, 6, 6, 5, 6 = .37 inch average.

These results are set out in diagrammatic form in the graphs, Fig. 1, giving the line for the tensile strength in four selections, natural, bleached, dyed and polished, and Fig. 2 giving the elongations for the same varieties. Along the bottom 10 tests are marked out in succession, and Fig. 1 shows ounces along the side, while Fig. 2 gives the elongation in sixteenths of an inch. One outstanding feature of those graphs is the relative position of the polished yarn. In Fig. 1 this yarn is of higher tensile strength than any of the other grades, while in Fig. 2 the elongation is reduced almost to nil. Moreover, this yarn in the process is rendered extremely smooth so that it slips easily through the needle aperture. As the stretchiness has been to such a large degree eliminated, it follows that it will be well able to stand the jerks of the needle at high rates of speed. In the Fig. 1 the strength is lowest in the natural form, both the dyed and bleached showing a small increase in tensile property. Bleaching is noticed to have had a markedly reducing effect on the elasticity being next to

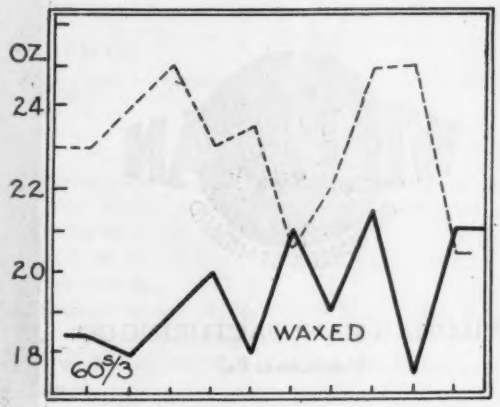


FIG. 3

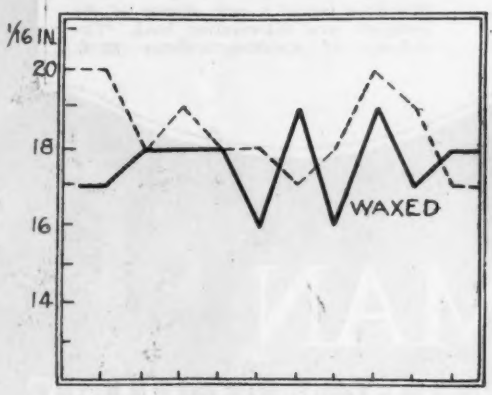


FIG 4

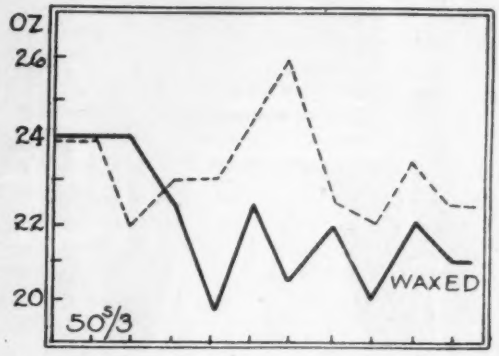


FIG. 5

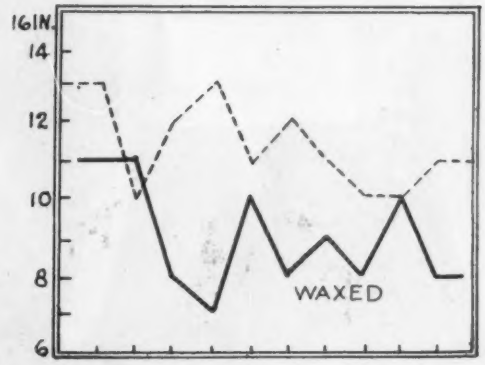


FIG. 6

the polished yarn in this respect. The dyed yarn is highest on the stretch side while the natural is also high.

One of the most commonly used threads in sewing knitted goods is the 60s/3 counts, bleached white, which is found very largely in the flatlock, lockstitch and a number of other sewing and seaming machines. The following gives two tests made on this variety, one bleached and the other bleached and waxed.

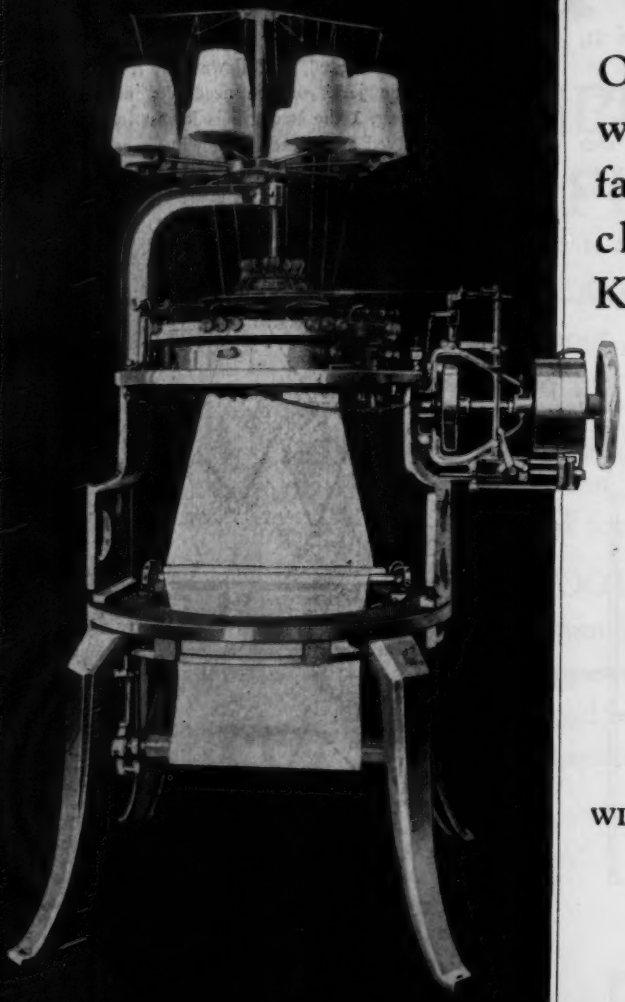
Bleached, 23, 24, 25, 23, 23.5, 20.5, 22, 25, 25, 20.5 = 23.15 ounces average.

Bleached and waxed, 18.5, 18, 19, 20, 18, 21, 19, 21.5, 17.5, 21 = 19.35 ounces average.

Bleached, 20, 18, 19, 18, 18, 17, 18, 20, 19, 17 = 1.125 inch average.

Bleached and waxed, 17, 18, 18, 18, 16, 19, 16, 19, 17 18 = 1.1 inch average.

These results are given again in graph form in Fig. 3



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for the tensile strengths, and in Fig. 4 for the elongations, 10 tests being marked along the bottom with ounces up the side for strength and the elongation in sixteenths of an inch.

In this case it is noted that the waxing has had the result of decreasing the average tensile strength from 23.15 ounces to 19.35, which is clearly observed in the graph. In the case of the elasticity or elongation, the waxing has had a slightly reducing action on the stretch of the yarn. It has been rendered more compact and the surface more glossy.

Another series of tests was made on 50/3 cotton yarn which is also used largely for sewing knitted fabrics and

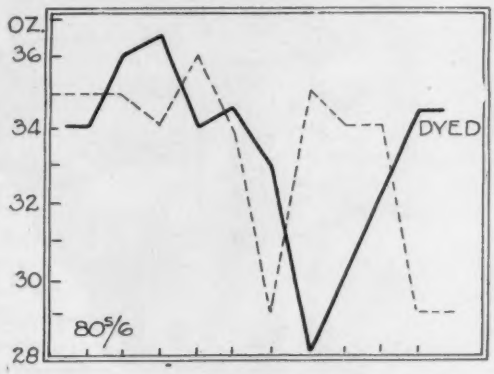

FIG 7

the following gives a similar series of figures on this yarn, natural and waxed. The thread is right hand twist and there are 24 turns per inch.

Natural, 24, 22, 23, 23, 24.5, 26, 22.5, 22, 23.5, 22.5 = 23.3 ounces average.

Natural and waxed, 24, 24, 22.5, 19.5, 22.5, 20.5, 22, 20, 22, 21 = 21.9 ounces average.

Natural, 13, 10, 12, 13, 11, 12, 11, 10, 10, 11 = .74 inch average.

Waxed, 11, 11, 8, 7, 10, 8, 9, 8, 10, 8 = .56 inch average.

These results are set out in the usual form in Fig. 5 for

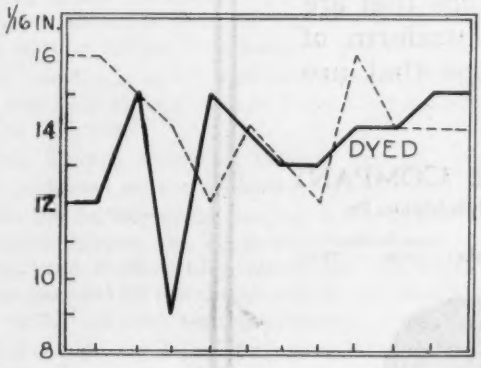

FIG 8

the tensile breaking strain and in Fig. 6 for the elasticity or elongation. In each case the waxing has had the effect of reducing the tensile strength from 23.3 to 21.9 ounces and the elongation from .74 to .56 inch average, and these differences are shown very clearly in the graphs.

In the case of sewing on buttons and making the button holes a specially firm variety of sewing cotton is essential and for this reason a very much stronger variety of this thread is required. 80/6 counts of sewing cotton is a standard size for this purpose and it registers a much higher breaking strain than any of the other varieties referred to. This variety is often made from Egyptian carded yarn and the twist is right hand. The details are as follows:

Bleached, 35, 35, 34, 36, 34, 29, 35, 34, 34, 29 = 33.5 ounces average.

Dyed, 34, 36, 36.5, 34, 34.5, 33, 28, 30, 32, 34.5 = 33.25 ounces average.

Bleached, 16, 15, 14, 12, 14, 13, 12, 16, 14, 14 = .875 inch average.

Dyed, 12, 15, 9, 15, 14, 13, 13, 14, 14, 15 = .83 inch.

These results are set forth in the usual way in Fig. 7 for the tensile strength, and in Fig. 8 for the elongation.

Among the Knitting Mills.

The hosiery mills at Milwaukee, Wis., are operating at top speed and production, with orders showing a big increase over last year's business. The two largest companies reporting an output of 80,000 dozens a week. However, buying still continues on a hand-to-mouth basis, officials of leading concerns declare. Prices, it was announced, are held stable despite recent advances in the raw silk market.

The Phoenix Hosiery Company plant is running at full production, with some departments operating on an overtime basis. Sales show a substantial increase over last year, about 14 per cent. This company has 3,600 employees on the payroll.

The Holeproof Hosiery Company is also running at capacity production with 3,000 employed turning out 60,000 pairs a day, fancy, plain and full fashioned. Orders also indicate an upward trend of business and assure continued heavy production, showing an increase of 18 to 20 per cent over last year.

Optimistic statements were given out in regard to both sales and output at the Everwear Hosiery Company's factory. This concern is operating at capacity and running ahead of last year. The outlook for the coming months is declared to be exceedingly bright, Holeproof, Phoenix and Everwear officials say, with full fashioned in big demand, they are looking forward to big and better business now that things are moving.

In line with the trend in two of the major divisions of knitted goods, toward closer coordination of production and distribution, Pilling & Madeley, Inc., manufacturers of seamless hosiery, Philadelphia, at the October meeting of the directors elected as the executive board the officials of the Shreve & Adams, New York, selling agents, who for more than a half a century have sold the output of the Pilling & Madeley mill. Walter W. Taylor, president, and Tracey A. Taylor, secretary, of Shreve & Adams, were elected president and vice president respectively of the hosiery company, which at the same time filled the other offices with the election of Henry Fletcher treasurer and H. P. Lucht secretary. The two latter are, respectively, treasurer and assistant treasurer of Shreve & Adams. Frank E. Morris was reelected general manager, a position which

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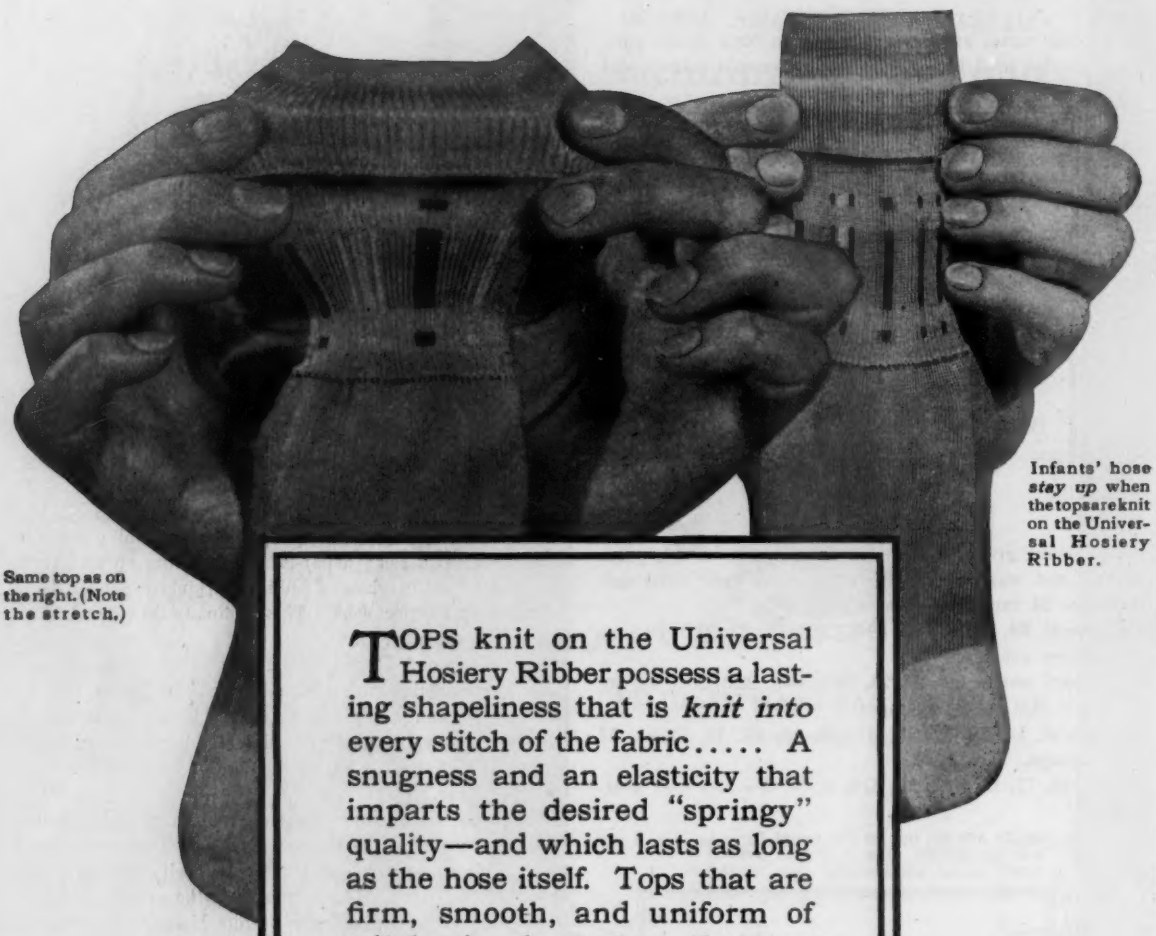

Same top as on the right. (Note the stretch.)

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he has filled successfully for a number of years. Pilling & Madeley are specialists in juvenile fancy and ribbed hosiery and also make half hose. A considerable part of the plant has been operating overtime for some months.

Alterations which are under way in one of the two hosiery mills in Camden, N. J., operated as branches of William F. Taubel, Inc., are taken to mean the company is preparing for the installation of a full fashioned plant. There is current a rumor that the company has placed an order for around 25 machines of German build, and as it is known a full fashioned installation was contemplated a few months ago, when a contract for machines was under consideration, it is believed in the trade that very early in 1927 the company will have entered the full fashioned field.

The Rosedale Knitting Co., operating a large full fashioned hosiery plant at Reading, Pa., has placed what is said to be the largest contract for full fashioned machines ever executed by an American manufacturer. The contract, it is stated at the office of the company, calls for approximately 300 high speed Carl Lieberknecht machines, a number of them of 45 gauge. An addition to the group of factory buildings is in the first stages of construction. The new equipment will be installed as rapidly as shipments are received.

The Reading (Pa.) Full Fashioned Hosiery Mills, in operation less than a year, will double the plant of 42 gauge machines, engaged at present on service weight chiffon silk hose.

S. S. Miller Hosiery Mills, Reading, Pa., have established a branch at Chase City, Va., to be known as the Chase City Hosiery Mill. 100 knitting machines have been transferred to Chase City from the Gibraltar, Pa., plant of the company, where operations have been discontinued.

Inspiration Hosiery Mills, Wytheville, Va., are installing equipment in their new plant.

An addition has been made to the plant of the Standard Hosiery Mills, Burlington, N. C., for the installation of forty knitting machines and complementary equipment for manufacturing fancy half-hose.

Tampa Knitting Mills, Tampa, Fla., have begun operation with 19 knitting machines, and 36 sewing machines, making misses' and children's underwear. W. F. Kemp, manager, announces plans for expansion of the product into lines of bathing suits, sweaters, golf stockings, etc.

An installation of 300 split-foot machines, 240-needle, has been made at the Charles H. Bacon Company plant at Lenoir City, Tenn.

Paul Knitting Mills, East Radford, Va., has installed fifty additional knitting machines.

The new building of the Gardiner & Waring Co., being erected at Florence, Ala., will be 60x280 feet.

Southland Knitting Mills, Macon, Ga., will spend approximately $40,000 in a new plant which will house bleaching, dyeing and manufacturing equipment.

McEwen Hosiery Mills, Burlington, N. C., have purchased twelve new 42-gauge full-fashioned hosiery machines which will be added to the seamless manufacturing equipment now in operation. J. H. McEwen is proprietor.

An addition 50x70 feet is being made at the Janet Hosiery Mills, Shelby, N. C. where considerable new equipment will be placed.

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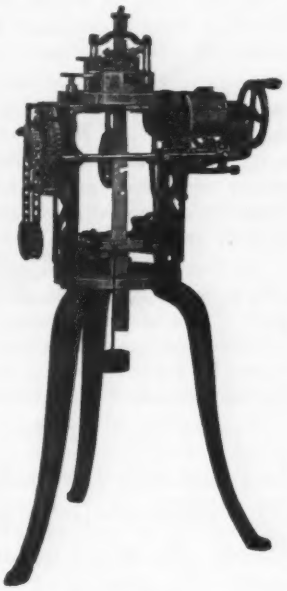

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Solving the Handling Problem

BY DAVID I. DAY.

Cotton manufacturers in the United States, in common with the rank and file of business men in this country, are convinced that placing business upon a more profitable basis is partly a matter of cutting production costs. That fact is known because the replies from manufacturers and textile men, throughout the South as well as the North, to a recent questionaire of a government official in every one of more than fifty letters stresses this phase of getting things on a better money-making basis.

Visits to the average plant will reveal the truth of the statement that the costs of office management have been greatly reduced over a decade ago by the introduction of more machine work. The various devices installed have enabled fewer office workers to do more and more dependable work. This, in a large sense, is true in the factory where the trend is constantly in the direction of cheaper production through mechanical assistance.

An extremely large per cent of the country's executives have, however, been overlooking the factory warehouse and shipping room. A recent survey shows many plants equipped with the best mechanical equipment in factory proper and office are still handling raw materials and shipments of finished goods much as they did twenty-five or more years ago.

At first glance, the shipping room and the warehouse seem to be small factors of the large whole of the industrial plant. This is true, comparatively speaking, but there are astounding possibilities here to save money as has been proven by a few pioneers in the work of slashing costs at the two extremes of the factory chain.

Good authorities have estimated that a toll of a billion dollars a year is exacted from the consumer of American-made goods because of antiquated methods of handling raw materials and the resultant manufactured articles. Only half of this sum approximately is charged up to the manufacturer. The other half of this unnecessary production item, however, and probably more than half can fairly be laid at the doors of the railway terminals, steamship piers and other places where goods are handled in transit.

This is a small amount of money compared to the enormous value of the manufactured output of this country in a year but we may well imagine what an uproar would result were Congress to assess a similar sum to the public's direct taxroll. They make no protest about paying the billion through extra freight handling costs because the average consumer cannot put his finger on the leak.

An actual instance of what this added burden may mean even in a comparatively small industrial plant is found in a check-up made by the officials of a New Jersey factory employing 41 men to load and unload materials between cars and the warehouse floor. These men were paid an average of 50 cents an hour.

Observations showed that one box was handled six times before it rested in its place in the box car. This suggested a decided re-arrangement of trucking aisles and better storage methods. A ramp conveyor and an electric tiering machine were purchased at a cost of $5,225. Installation of the machines cut the necessary number of laborers to ten men. The annual labor bill was shaved from $51,168 to $12,480.

Most factories in the South have better managed shipping rooms than this one and the saving possible through the purchase and intelligent use of machines will not, in most cases, be equal to that effected in this factory. The fact exists beyond cavil, however, that in nine-tenths of the concerns still depending largely or wholly upon manpower in handling materials and shipments, a large and astonishing saving can be made.

While railroads and steamship pier officials have so many different sorts and shapes of containers and packages that the full benefits of handling machinery are difficult of realization, the factory executive usually does not have to contend with this source of worry.

In cotton mills and other textile plants the shipments are in comparatively few standardized forms and weights. The various raw supplies come in forms as standardized as the cotton bale or the yarn case. Few of these industrial plants, even when supplied with plenty of cheap labor, can afford to pass up investigating the possibilities of suitable handling machinery. For we learned back in college days that even cheap man-power is very expensive in an age of machinery. In China and the Malay Peninsula where coolie labor can be obtained for a few cents a day, it is very doubtful if it can compete upon an economy basis with electric power.

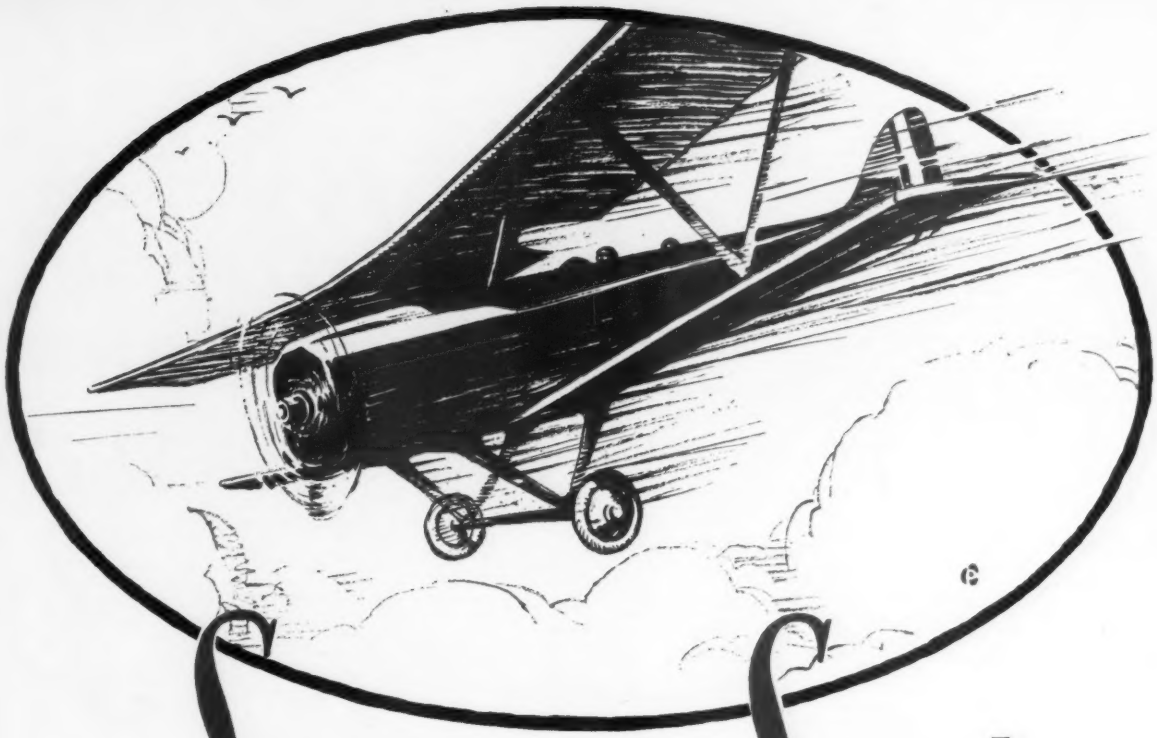
There is also a potential personal element. It meant little a century ago. It appears in parts of the country now in a variety of forms and will probably be met in other forms in the future.

With the employment of 100 men in handling materials and goods there is five times as many personalities to deal with as with 20 men supplemented by machines doing the work of the other eighty laborers.

The machines not only eliminate a major potential labor trouble and a more or less constant labor dissatisfaction. They make supervision easier and the twenty men who remain on the payroll will be much more contented and efficient than they were before.

With the introduction of package conveyors and interplant trucks for the carriage of burdens and tiering machines or similar equipment for elevated placing of containers, it becomes soon apparent that a new morale has been injected into the men. There is no intelligent laborer living, white or negro, who does not take a pride in a labor where the machine, tireless and efficient, stands the brunt of the battle. This spirit invariably means more careful handling of shipments which saves direct loss to the manufacturer in the case of raw materials and better customer-satisfaction in the case of shipments of finished products.

If we do our best; if we do not magnify trifling troubles; if we look resolutely, I will not say at the bright side of things, but at things as they really are; if we avail ourselves of the manifold blessings which surround us, we can not but feel that life is indeed a glorious inheritance.—John Lubbock.



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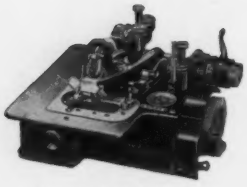
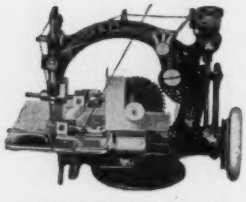
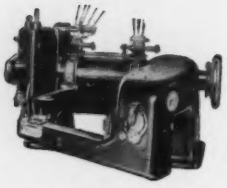


OVERLOCK MACHINE



CHAINSTITCH SHELL-SCALLOPING MACHINE



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The LOCKSTITCH MACHINE for sewing on shields, attaching shoulder straps, etc.

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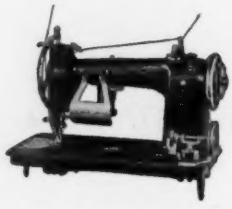
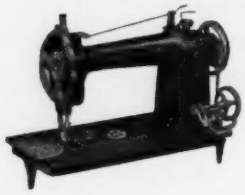


ZIG ZAG MACHINE



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Troubled with Spots on Rayon.

EDITOR COTTON:

The thing that is bothering us now more than almost any other one thing is the appearance of colored spots in our Viscose rayon. These show up with no particular regularity, and appear to be in the single strands of the rayon. When knitted up into the stocking they appear throughout the stocking, and the color varies slightly, but is usually about a dark brown shade. These spots do not come out in the dyeing and finishing processes. I want to know what the trouble is.

Someone might say that we should take this up with the people from whom we get our rayon instead of writing "Knitting Kinks" about it. We have already done this, but their men seem as mystified as we are about it, and so I am turning to your discussion department for whatever suggestions any of your readers may have to offer.

CONTRIBUTOR No. 1009.

Knitted Hat Bands a Fad for Spring.

EDITOR COTTON:

Replying to your contributor's suggestion, in the "Knitting Kinks" department for October, that some of us discuss new ideas, style possibilities, etc., I am gioing to respond to his comment on fancy shades in underwear by talking a bit about outerwear.

There now seems a strong possibility that men, when they are dressed in their new Spring suits, will use a different kind of a hatband to that which has been prominent in other seasons. Some manufacturers of novelties are now making the knitted hatband in all sorts of novel patterns as well as the plain colors, and at the moment it appears as though they might be popular because of the new "idea."

Knitted ties have been slowly coming to the front for the past two seasons, and they are more prominent in the holiday lines being offered for the retail trade than for some time, being made in attractive patterns which cannot help but appeal to the consumer. Strong colors are featured in fancy stitches such as open work and drop-stich, forming stripes, plaided effects, and unusual polka dots which are rather illusive; yet the close observer can see a blue dot on a brown or gray ground and even the dark green, although we are told that the jungle greens are passe and not being made in colors for the dyeing of yarns used in the manufacture of knitted hatbands or ties.

To correspond with the knitted band, knitted tie, etc., some new designs of rayon and silk half hose are also being

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

"tried out" and all three boxed together for the holiday trade, sponsored by some of those manufacturers who try to reach the more sensational buyers. However, the idea is well liked, and while it is thought by some that the three should not be boxed, it is believed that manufacturers are going to make more of them and in a wider range of color and design. It has often been the fad to have hosiery and ties to match, although this is believed to have been the first time that the knitted hatband has been made to correspond with either or both.

While there is some sentiment in favor of color, there are many conservative buyers that show a preference for black with the colored dot, stripe or small figure, believing that consumers still prefer the subdued colors taking them as a whole, rather than the brilliant shades which have been featured in some other lines and in many cases not generally accepted. However the flamboyant bands on Summer straws, while not knitted, seemed fairly popular in many sections. And these have been followed by rather aggressive stripes on the new Fall felt shapes. So it may be that with the advent of short bobbed hair and severe "mannish" effects in clothes affected by some women, men are going to retaliate and take over matched outerwear and mauve undies, to say nothing of the possibilities in mufflers.

What is to be the trend in half hose patterns for next Summer? Does anyone care to guess?

CONTRIBUTOR No. 376.

A new branch office has just been opened in Utica, New York, at 107 Foster Building, 131 Genesee St., by Link-Belt Company of Chicago, Philadelphia and Indianapolis. This, their thirty-fourth office, and the third in the state of New York, is to be devoted especially to the sale of Link-Belt silent chain and Link-Belt roller chain; and will be in charge of F. P. Hermann, Jr., who has had many years experience and contact while located in the New York office of that company.

Loose Filaments on Japan Tram.

EDITOR COTTON:

We are using six thread crack double extra Japan tram plaited over 150 denier rayon in making ingrain fancy hosiery; are buying the tram in skeins and degumming and dyeing same in open tubs. Trouble is being experienced with the Japan tram due to loose filaments, which cause the thread to hang on the bobbins.

We are taking great pains in handling these skeins in dyeing, but it seems that after degumming there are a certain amount of filaments which have loose ends. We have tried adding a small amount of gum tragacanth to the dyed tram in the rinse water, but the silk so treated does not have the proper running qualities and gives more trouble than the silk which is completely degummed.

It would be a pleasure to have your advice as to how Japan tram should be treated in the skeins so as to produce the best results on the knitting machines.

CONTRIBUTOR No. 367.

Why the Backing Yarn Misses.

EDITOR COTTON:

This is in response to the question of "S. H. (Tenn.)," who reported having trouble with the backing yarn missing in a fancy half-hose on Banner machines, and a sample of whose difficulty was submitted to me. I have had experience on this, and am making about the same pattern he is, although I am not having any trouble, so I will give you my set-up of yarn fingers and drum on the striper:

Starting at the front of the machine, yarn lever No. 1, three holes, thread white silk in front hole. No. 2 yarn lever, white mercerized in front hole of special plating lever with two holes. No. 3, two-hole special plating lever, five-thread silk in the front hole and 150 denier rayon in the back hole. Run tension on the five-thread silk and as little tension as possible on the rayon to keep the striper sinkers from making loops on the back of the stripe. No. 4 lever, 2 60s/2 mercerized for heel and toe. No. 5 lever is blank.

Then on the striper drum, cut the back end off on a slant on the cams that drop in for the yarn change.

Also see that the yarns go under the yarn trap No. 370 on the binder. See that the trap sits down tight on the yarns so they cannot slip out.

Here is another way I have of stopping any chance of the yarn not going under the yarn binder. Take the old binder off and put on a new one like the one on the split-foot machines, Part No. 3088, and let it stick out over the end of the anchor piece just far enough so that the needles or sinkers will not rub against it. Then the yarn cannot miss going under the binder. CONTRIBUTOR No. 1006.

EDITOR COTTON:

Answering "S. H. (Tenn.)" on overcoming the trouble he is having on a Banner machine making fancy half-hose, I will say that first of all it is quite possible that the speed is being maintained on his fancy machines the same as on the plain work. This is not advisable. The speed should be cut down, as the yarn fingers bounding out and in, which is necessary for fancies, is sure to cause the yarn to rebound as it comes down. And possibly, although not mentioned, the yarn being used is harsh or brittle, which is often the case in using dyed yarns.

I have found that by winding the dyed yarn through a wax it helps a great deal. The wax helps to lay the kinks. Then by using a compensating yarn tension supplied by the Hemphill Company for the machine and set at the right tension wonders are worked, but by all means regulate the speed of the machine, for the waste and seconds saved by the speed control will be a saving.

In regulating the tension device, adjust this tension so that it will not put too much drag on the yarn, but merely so that it will take up the rebound and take the slack out of the thread. It is evident that the yarn jumps ahead too fast, and when the yarn finger jumps down that it throws the surplus yarn ahead. It is either the speed of the machine on these changes, or having no control on the threads, that causes the yarn to kink or loop at the needles.

BOB (CANADA).

Wishes to Exchange Experiences on Handling Banner Machines

EDITOR COTTON:

With so many different makes of knitting equipment, that have very little mechanical similarity, I should imagine that one of your biggest jobs in connection with "Knitting Kinks," must be to keep a varied collection of material that will interest all readers operating the different kinds of machines.

Of course, all of the general articles and letters you publish which refer to management, general costs, waste savings, etc., are of interest to us all, but when it comes to discussing mechanical features of the Scott & Williams or Banner type of machines, for example, it frequently is the case that what applies to one type does not have an application to the others.

I happened to think about this not long ago when I was reading, in a recent issue of COTTON, the compilation of replies which you published in answer to some questions with reference to Scott & Williams Model K machines, etc.

Now, at our plant we operate the Banner type machine, exclusively, making plain and fancy half-hose. After reading what these fellows had to say as to their different practices on the K, the thought occurred to me that a similar comparison between mill men using the Banner equipment would be as interesting and of direct value to us chaps.

I therefore suggest something of this kind, and in order to start the ball a-rolling, I will give our practice, and hope some other Banner men will tell what they are doing so we can check up and see how we stand in comparison with the other mills who make these reports to "Knitting Kinks."

On our transfer machines on fancy half-hose, we have found it most practical to allot eight machines to the knitter, with the machine on slow speed. A topper on this work can furnish tops for five or six machines. This is 220-needle work. The fixers in this section of the knitting room look after about 33 machines.

Now on our plain 220-needle Banner work, our knitters run ten machines, and fixers take care of as many as 50 machines.

Our needle breakage on the fancy work of course is comparatively high, but this averages around two needles

to every three dozen. On the plain work it runs around one needle to every three dozen.

T. W. (TENN.)

Making Better Fixers.

EDITOR COTTON:

In developing men as machinists or fixers there are a few things that should not be neglected. These I will explain as follows:

The beginner should thoroughly acquaint himself with each part of the machine and ask himself why it was made as it was and why it has to work at a certain time and move a certain amount. If he will learn to close his eyes and think through the whole process of knitting a single stocking, and do it often, it will be a very great help in analyzing the cause of the various troubles that arise. There is nothing that will help him to concentrate on a problem so much as this practice, which can be done at odd times when he has nothing else in particular to do.

After the fixer has developed a high degree of expertness with the purely mechanical side of his work, that is, when he can repair and adjust a machine so that it will go through all the motions perfectly, he still has a whole lot to learn. There will be things that he cannot reason out, but nevertheless they are important details that go to make quality product, and this part of his development is by far the hardest. This is when he must develop his artistic sense. This is the part that will take months of painstaking effort, but the result will be worth all the effort put forth.

Every mill has a standard of quality which it strives to maintain, and over which the inspection department is guardian. Here is a chance for the machine fixer to do some work for his mill. If he can produce from his machines work that is superior to the quality standard set by the inspection department he will not only have made himself a better workman, but will have raised the quality standard of the mill. Because if it is seen that it is practical to produce better quality work the management will insist on it being done.

A person who can be the cause of the standard of quality being raised, is going to stand out among his fellows. Strive for excellence. CONTRIBUTOR NO. 383.

An Aid on Heavy Plaiting.

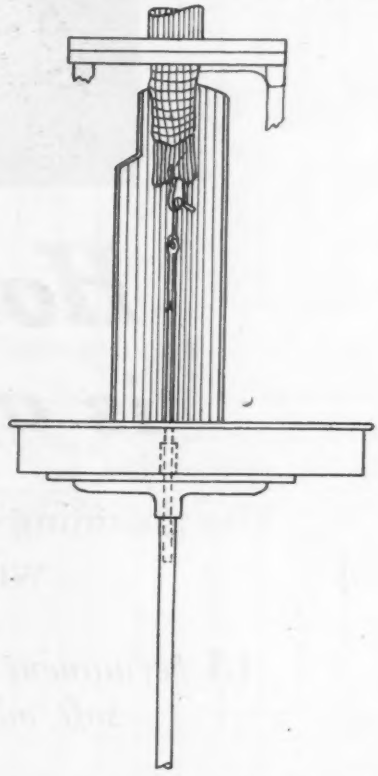
EDITOR COTTON:

Please allow me space in "Knitting Kinks" to describe a "kink" which I have devised that has been of tremendous help to us in our plaiting problems. You know, ever since the demand for fancy plaited goods in half-hose has come in, and it seems certain to run for a while, we fellows who have to make these goods for the office have had our share of trouble in getting a uniform, accurate plaiting all the time, particularly in the more intricate patterns.

This trouble has been reflected in various letters to your knitting discussion section from men asking different questions about various plaiting troubles, and discussing different kinds of tension devices and different kinks for getting around the many difficulties.

So, I would like to pass along to your readers something that I have found very beneficial. We are making a lot of plaited work on Banner machines, a large part of which is heavy-plaited stuff. We happen to have some Banner split-foot machines also. As your readers who are familiar with this type of machine know, because of the reciprocating motion given in the foot on the split-foot action, this machine is equipped with a special design of half-hose pan bracket, including a hook which is fastened to the half-hose and which holds up a long rod known as a half-hose weight, which I have endeavored to sketch in the accompanying illustration.

What I did was to put one of these arrangements from a split-foot machine onto one of our regular Banner machines which was on heavy-plaited work, to see how it would do, and I have later ordered these brackets, pans, weights and hooks from the Banner people and put them



on other machines. This long weight attached to the hook which is clipped into the top of the half-hose goes down through the opening in the pan as the stocking is being knitted.

My idea that this helps in plaiting—especially in the heavier plaiting—comes from the principle that it eliminates off-plaiting and throw-outs and streaks and troubles of similar kinds. It lets the needle shed the stitch in more of a uniform manner, because the stitches are being pulled off of the needle at the proper time and we get an even tension all of the time. It also helps the striper sinker to throw the yarn over the other yarn and produce the stripe effectively.

I think anyone doing plaiting work would find this of interest, and of course I would like to know if anyone tries it out. The necessary parts can be secured from the machine manufacturers. W. P. (GA.)

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A Simple Time Keeping System.

EDITOR COTTON:

We have a very convenient and simple arrangement for keeping the time of all of our piece-workers. We use two cards, as shown in the accompanying illustrations.

The card at Fig. 1 is used for all operations up to the finishing department, which are conducted on the second floor—that is, the knitting, looping, etc. In these departments we run our work through, usually, in 20 dozen lots. The work is taken up in these bags at each operation by a man who also acts as time-keeper. As he takes up a bag, he credits the operator with it by making a punch in her card under the proper day on the card. These are counted up at the end of the week, the total put down and the pay figured from that.

This card, while simple, is all that is necessary, and it is also very flexible. For example, should we want to run through a rush lot other than 20 dozens, or wanted to pay a different rate, we simply would change the number of

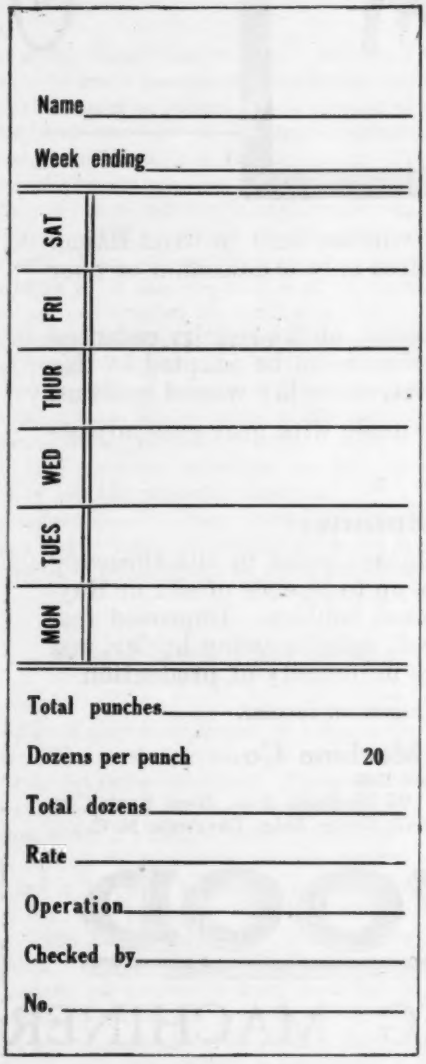


FIG 1

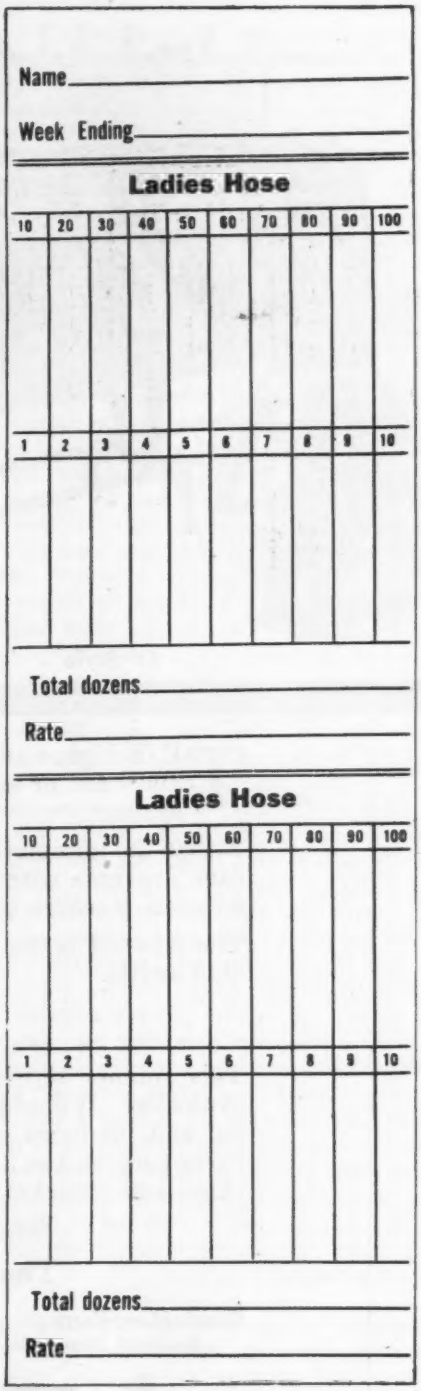
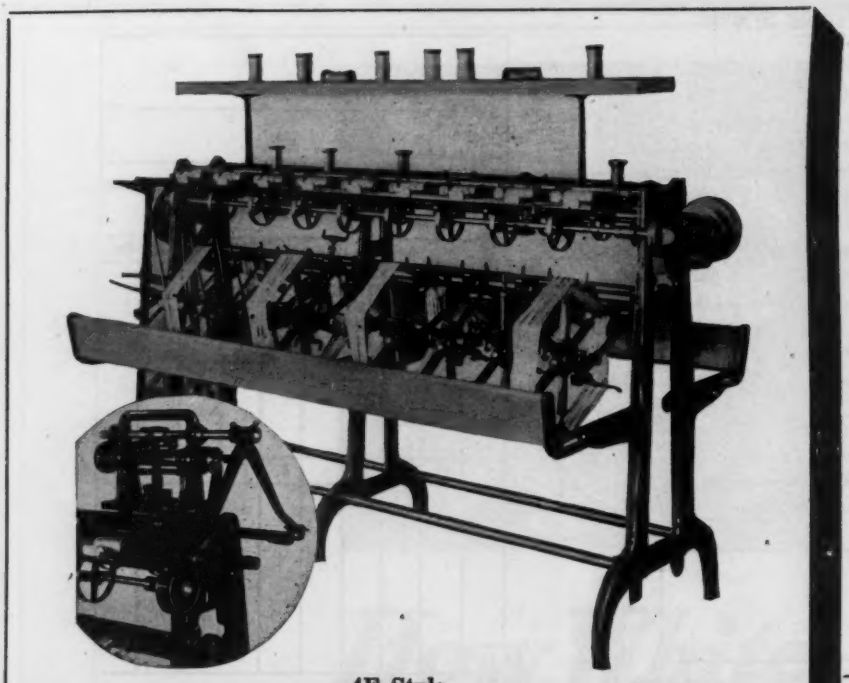


FIG 2

dozens per punch, or the rate paid, and it would also be shown up opposite the day on which this particular work was done.

We use a very similar card for the finishing operations after the goods have left the dyehouse; that is, boarding, etc. This is shown at Fig. 2.

As the boarder or operator finishes a lot, the time-



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ATWOOD

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keeper—we have one on the second floor and one downstairs in the finishing department—simply punches the card with the correct number of dozens.

The card, it will be noticed, has two sections. This is for use in case a different rate may be paid for different styles, with the possibilitiy of the same operator handling the different styles, this simplifies the work in making up the pay-roll.

Different colors of ink for the printing can be used on both of these cards for keeping them separated as to the kind of work being run, etc. CONTRIBUTOR No. 1012.

Rough or Chafed Spots on Hose.

EDITOR COTTON:

We think that one of the greatest needs in the hosiery manufacturing game today is more accurate practical knowledge in regard to dyeing and finishing, especially on silks and fancies. If your "Knitting Kinks" department can provide us with information along this line, in addition to technical matter relating to the manufacturing processes, it will expand its usefulness in a very important direction.

Just at the present time, we—and I find that a number of other mills are in the same fix—are having considerable trouble with chafed or rubbed silk as a result of the degumming, and sometimes of the dyeing operation. We have more trouble with it in the degumming. The stockings appear all right when coming to the finishing department from the manufacturing plant, but after degumming in the dyeing machine, they have chafed places throughout their length. I am sending along some samples showing this difficulty so in case you take it up with other mills they can see just what we are contending with.

We de-gum and dye this hosiery in a modern standard make of rotary dyeing machine, in the regular way, and others besides ourselves have looked in vain for any roughness or other cause on the insides of the machines. We have sixteen dyeing machines, and this trouble is just as likely to crop up in one as another, not being confined to any one or any few particular machines.

Any suggestions which your readers with experience on this can offer, telling their opinions as to the cause and giving fully any remedies, will be greatly appreciated.

CONTRIBUTOR No. 1008.

Keeping Down Repair Costs.

EDITOR COTTON:

I wonder if very much thought is given to the saving of repair parts on hosiery machines in the average mill today. I do not believe so, myself. Experience in several hosiery mills has often shown an extravant use of parts, which most surely is a big cost item in every mill.

Look around the machinists' drawers, benches, in the corners and in the stock rooms in any mill and you will no doubt find parts which have been cast aside for various reasons. These reasons may be due to various changes in the machines, which have been made from time to time. Fixers themselves are careless in using repair parts, unless there is some system used to prevent this. Most mills today have a centralized store-room, where these parts are requisitioned out. The machinist cannot get a certain part, unless the requisition has the supervisors' okeh.

In fixing knitting machines there is a steady need for repair parts. As the cost of these parts are usually unknown, the machinist himself, as a general rule, does not think about price and is prone to be careless in his needs and demands. Of course, as the machines depreciate, new parts are needed and these must be renewed.

However, it is a good idea to have the head machinist or fixer, or adjuster, whichever he may be called, look at every part which it is claimed needs renewing, before a new one is requisitioned out. As a general rule he frequently can suggest some way to get around the trouble without using a new part. This means less expense for the mill and better satisfaction with the machines.

I was looking through some of the drawers recently and found a bunch of repair parts which were supposed to be obsolete, but three-fourths of them were as good as new. I found out by investigation that most of these discarded parts were the result of carelessness on the part of the men handling this work. For instance, let's take some of the parts used on a Scott & Williams machine. The drum stock used on the machine is worth around $1.00 a roll. There were various roll lengths in the drawers, which could be used for drum cams which are always being used on the machine. Probably a certain length was wanted from the rod, it was cut off and the rest thrown away.

I found chain links of every description, which were the standard links used on the machines in the mill. Various changes to the chains evidently were made from time to time, and the rest cast aside. When links were needed they were requistioned from the stock room. Of course, the head machinist in these cases evidently did not seem to care whether new or old ones were used.

There were screws of every size and description. When screws were wanted they did the same as with the chain links. There were stitch cams and side cams. These cams, some of them, were as good as new, and others had been ground in every way imaginable. Of course, this was due to the ignorance of the fixer, for as the stitch cams come from the factory, they are supposed to be the correct shape, save to concave them a trifle on the going down side of the stitch cam.

I found yarn tensions, in whole and in part. These tensions cost varying prices depending on the tension. Parts of every description needed on a knitting machine were there waiting to be used, and instead of using these parts the fixers were requisitioning new ones from the stock room.

A closer check on the use and care of these parts should prove a profitable and worth while investment in any mill. Parts should be had *when needed* but only when needed. There is a vast difference between *when needed* and *when called for.* CONTRIBUTOR No. 1005.

Bulletin No. 1560 recently issued by the Hyatt Roller Bearing Company, Newark, N. J., contains data of value to engineers and draftsmen concerned with the designing or development of plant and production equipment.

This Bulletin is supplemental to other Hyatt publications in that it covers in one volume bearing applications to general types of Industrial equipment. Aside from the conventional load and rating tables it includes formulas for determining bearing sizes for specific applications, suggestions for mountings—with drawings—photos of diversified Hyattized equipment, and construction details of all types of Hyatt roller bearings.

The Yarn Market

Philadelphia, Pa., October 13, 1926.

After giving birth to the promise of a better situation, during the first weeks in September, the Philadelphia cotton yarn market experienced a reversal of form, and as this report was written for last month, it had entered into a condition of dullness. This came in spite of the fact that every index usually used by prognosticators pointed to a logical basis for predictions of optimistic proportions.

The anticipated improvement failed to materialize, however, as was indicated in the closing paragraphs of last month's discussion of conditions, and the succeeding weeks have witnessed no upturn in the situation, but rater a continuation of the depressed condition with which the market approached the closing quarter of the year. Fundamentally, developments recently to the contrary notwithstanding, when the temporary conditions now attributed to the market's weakness have run their course, observers feel, the natural laws are going to crystallize a much better basis upon which the market shall operate.

Unanimity of opinion is rarely found in any market, but it is pretty universally agreed this time that the major factor influencing the market's present downward trend has been the raw cotton market situation. In addition to a couple of Government reports—which in themselves would have a tendency to disrupt calmness—the nature of these reports, bringing the result it did upon cotton prices, tended thereby to pull yarn rates along, too. The effect touched no particular sections of the list, impartially decreasing the trading value of practically all numbers, with the exception of those with peculiar conditions of their own to bolster them up.

Some logic for the general conclusion mentioned is found in the fact that should the current situation in the cotton market not have developed, yarns were headed to a stronger place, almost every influencing factor pointing in that direction. A lack of indiscreet operation, an improved condition from the standpoint of distributing and retailing interests, comparatively few stocks of yarn provided for the future—almost everything presaged improvement. But the force of the cotton market could not be resisted, and the result was a reduction in rates.

The spinners, who during the past several months have demonstrated determination and firmness of attitude, continued in this frame of mind in the face of lower cotton and the increasing prospects, according to the reports, of larger crops thereof. They perhaps were basing their decisions upon a survey of the generally healthful conditions mentioned. The dealers, in closer touch, were first to respond to the pressure of buyers' disinterest and salesmen's weather reports, and the first concessions made pertained to stocks of yarns already in the hands of the market.

Eventually, however, the spinning division submitted to the situation, and general reductions could be announced, and during the first part of October the list was at the lowest level since the first week in September, having receded from what might be considered the present peak which was reached around the middle of the ninth month of the year.

In spite of this submission, however, there was at the same time evident a persisting firmness of the spinners' attitude which prevented it from being an unconditional surrender. In spite of the more or less dismal situation pictured, there was—as always—some substantial business booked, the low price of cotton was not entirely disastrous to a lot of spinners, and with an upward trend imminent in the textile trade generally, factors analyzing the situation feel that when the market has settled itself from the disturbing influence of recent fluctuations, buyers, in need of yarns to fill their own requirements, are soon to be considerably more approachable than has been the case.

Quotations for October 15th on the Philadelphia market were as follows:

Single Skeins

4s to 8s	25	10s	26
12s	26½	14s	27
16s	27½	20s	28½
24s	31½	26s	32½
30s	34½		

Single Warps

8s	26	10s	26½
12s	27	14s	28
16s	29	20s	29½
26s	33	30s	35@35½
40s	45		

Carpet and Upholstery Yarn in Skeins.

8s 3-4 hard white warp twist	25
8s and 9s 3-4 tinged tube	21½
8s 3-4 hard twist waste	20½

Two-Ply Skeins

8s	25½	10s	26
12s	26½	14s	27½
16s	28½	20s	29½ @30
24s	32	26s	33
30s	35	40s	44

Two-Ply Warps.

8s	27	10	27½
12s	28	14s	28½
16s	29	20s	29½ @30
24s	32½ @33	26s	34 @34½
30s	35½ @36	40s	45

Frame Spun Carded Yarn on Cones

8s	25	10s	25½
12s	26	14s	26½
16s	27	18s	27½
20s	28½	22s	29
24s	30	26s	31
30s	33	40s	44
30s double carded	34	30s tying in	32½

Two-Ply Combed Peeler Skeins and Warps.

8s to 6s	39	20s	40
24s	41	30s	44
40s	50	50s	56
60s	65	70s	78
80s	85		

Single Combed Peeler Yarn on Cones.

18s	40	24s	42
30s	45	36s	48
38s	50	40s	52

Mule Spun Carded Yarn on Cones.

10s	31	12s	32
14s	33	16s	34
18s	35	20s	36
24s	37	26s	38
30s	39	40s	47

Mule Spun Combed Peeler Yarn on Cones.

10s	40	12s	41
14s	42	16s	43
18s	44	20s	45
22s	46	26s	48
28s	49	30s	50
36s	52	38s	55
40s	60		

Announcement has been made of the consolidation of "Dockham's American Report and Directory of the Textile Manufacture and Dry Goods Trade" with "Davison's Textile Blue Book," published by the Davison Publishing Company, 50 Union Square, New York City. The former has been published continuously by the Dockham Publishing Company, of Boston, for many years, being the oldest textile directory in publication. The Blue Book has a record of forty years of publication under Davison supervision. The consolidation, it is expected, will result in an improved service. The Davison Publishing Company announces that the two volumes will be merged into one, incorporating all of the features of both in one great annual register and directory to be published each July. The Publication offices will be at 50 Union Square, New York City.

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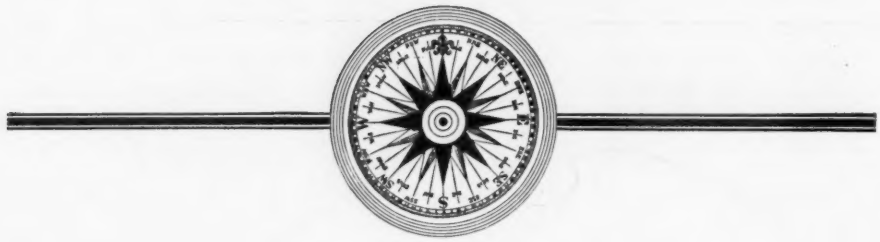

East ~ South ~ North ~ West

¶ In every section of the United States, the increasing popularity and improved quality of "Industrial" Rayon is resulting in an increased number of repeat orders.

The Knit Goods Market

A brisk primary market for hosiery and cotton underwear suffered some interruption from the October declines in cotton. With the stock market wobbly about the time of the spectacular slide in cotton, the question was raised, naturally, whether other raw materials might not sag in sympathy. That seemed a possibility to manufacturers of silk hosiery, and their commitments for raw silk have been on a very conservative scale. But the consuming public ignored the question and continued a good customer for its needs, while in the primary markets buying hesitated, mills in the meantime maintaining a healthy stage of operations, speaking generally.

Briskness prevails in the heavy weight cotton underwear market, while in light weights for next year jobbers are putting off 'till tomorrow in expectation of a readjustment of values. In the knitted outerwear trades there is, in spots, an exhibition of boom times activity, October showing a very healthy increase. At the dawn of a strong holiday distribution, seasonal lines of practically all knitted goods are facing a demand that presages volume business for mill and merchant to the end of the year and, in view of lower cotton, a revival of interest in cotton goods.

Hosiery.

Perhaps the outstanding feature of the hosiery market situation is the steadiness in mercerized and low end carded lines, these showing a nearer approach to stability than many types of hose in the higher price range. Improvement in demand for cotton hose appears to have been anticipated by manufacturers, for in government statistics covering reports from almost 300 identical mills, August production gained over July by 13 per cent, comparing with an increase of nine per cent in hosiery of all classes. Figures for September were not available at the time these comparisons were made, but it is apparent in the pronounced activity among northern manufacturers of carded hose that when the statictics for the last two months come out they will show no recession from the stage of plant operation.

There was especially heavy demand in October for carded half hose and misses 28 ounce ribs, prices of the latter advanced by 2½ to five cents a dozen by at least two mills which were sold so well ahead that they were declining orders for nearby deliveries. Northern factors say the leading southern manufacturers of low end hose were committed last month for their production for eight to ten weeks, and as confirming reports of pressure upon them for goods, there was some additional installation of additional knitting machinery. One manufacturer in Georgia and one in North Carolina found it expedient to increase production. It appears that manufacturers of carded hose for men and juveniles have the market situation well under control.

Shipments of wool and part wool, more particularly half hose, have been running big for some of the New England mills, the outgo for the three months to October exceeding that for the corresponding period of last year. One mill shipped out to jobbers in the first two days of October more than $50,000 worth of combination wool hose, most of it in women's lines, and the bulk to sell in retail stores at a dollar a pair. In two-tone effect the colors follow closely those prevailing in silk hose.

The Moorhead Knitting Mills, Harrisburg, Pa., made a drive with its Monito lines of wool and part wool half hose, full fashioned numbers to go over the counter at $1.50 a pair. All wool numbers of this company are in patterns, conforming to the notion that novelty half hose, while it may have gone over the top, is not fading as a craze, although it is the impression in many quarters that plain colors give evidence of a strong comeback for next spring and summer. In fact, there are reasons for believing plain color silk socks have improved their position for winter. A well known Pennsylvania mill might be mentioned as being in arrears with production of its split foot number, a 75 cent retail seller. A few months ago the mill was delivering from stock. Now it has nothing for spot, and last month installed more Banner machines. It is noted that production of silk half hose in August was considerably ahead of that in July.

Three manufacturers of men's novelty half hose sold direct to the retail trade, all of whom report practically no decline in demand, tell of a scheme of numbers of retailers for carrying assortments of colors while holding stocks down to a bare line of samples. The plan is to have manufacturers pack the socks in cartons of six pairs of a size but of no two pairs of the same pattern. Thus, with two cartons, each containing two pairs of a size, the dealer will have twelve patterns on an investment in but one dozen pairs. He may lose a sale because of having but two size assortments, but he finds which of the patterns leads in favor, and in his next order substitutes for those which proved slow movers. The mill having the dealer's initial order is pretty certain of frequent repeats.

A few important market factors have expressed entire satisfaction with what is described as hand-to-mouth buying, a term that has come to be regarded as a misnomer. "We prefer to sell a jobber for his month's needs to taking his order for, say three months requirements and later trying to persuade him to take goods which he feels he may not need," says a prominent mill agent. "This is the safer plan for the seller, who knows the retailer must make his money on turnover and may lose on leftovers, but it leaves the jobber to carry reasonable stocks."

"How far ahead should the functioning jobber buy?" an advocate of close operating was asked, to which he replied, "Well, when it comes to juvenile sports hosiery for next spring he ought to buy conservatively for deliveries in 90 days. By the expiration of that period he should be in position to gauge his requirements for 30 days, say, and the mill should be prepared to take care of frequent repeat orders placed a month ahead of delivery date. Of course this means close cooperation between mill and jobber, and I believe that is what we have arrived at or are coming to, so far as related to the larger establishments. Such a plan might not be convenient for the small, not well financed mill, but I regard it desirable for those who can adapt themselves to it."

Generally speaking, juvenile goods are perhaps the more unsatisfactory item in hosiery. This may be attributed in large measure to the matter of style, a term that is followed by a big question mark. Full length plain color ribs and silk and silk-and-rayon beginning with size 7½ are in so strong call that there is some uncertainty as to what

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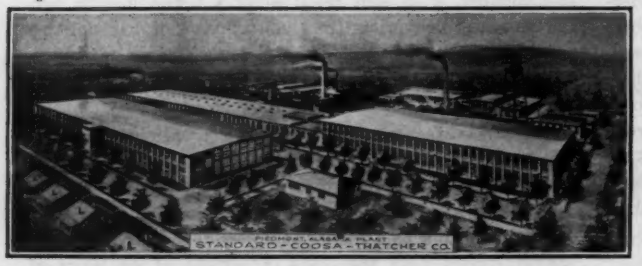

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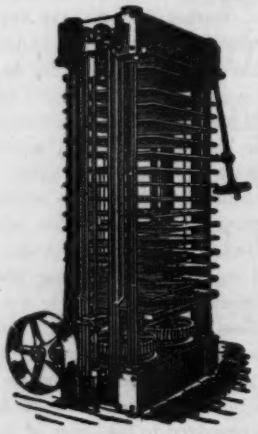

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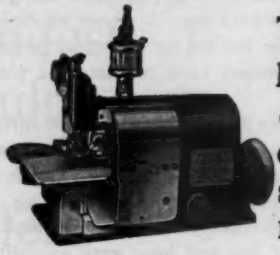

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will be the effect on the seven-eighth length sports hose, and as jobbers are, for this reason, operating ultra conservatively for the next season, conditions in numbers of mills are far from satisfactory. A few are virtually "loaded" with business. The Revere Knitting Mills, Philadelphia, for example, last month commenced overtime operation of the plant, engaged mainly on boys and misses golf hose. The management say they are sold ahead to the end of the year and can offer no encouragement to buyers offering orders for the early part of 1927.

Infants socks occupy perhaps the darkest corner in the hosiery field. Buying for spring has been, to date, on a more restricted basis than in any recent years. One or two mills have had enormous sales, but mainly to chain stores and catalog houses only. Jobbers are lagging, and one selling agency shows a list of more than thirty of last season's customers who have yet to place their initial orders, but promise to write them shortly.

In 1925 jobbers bought early, and in May and June this year mills had little to do. In 1924 they bought late, and the spring of 1925 found manufacturers under severe pressure for goods. This year mills had two dull periods—in the spring and again in the fall. Recalling the busy spring of 1925 following very late buying in 1924, the trade looks for much activity among mills once jobbers begin with their buying and supply order details.

Various interests agree that 1926 thus far has been their leanest year in infants socks in the history of their business. The big mistake, it is said, was to put artificial silk socks in the 25 cent class, some few lines being priced so low that they are a fairly profitable 20 cent proposition in chain stores whose maximum price for any article is ten cents and which put the socks across the counter at a dime a leg. In this connection is heard the suggestion that the business in socks would be more satisfactory had the price of artificial silk not been reduced. In infants, as in many lines of hosiery, readjustment is holding trading in check .

Nine out of ten hosiery manufacturers and distributors if asked for an opinion of the outlook for the seamless industry as related to women's hosiery would say it is at the beginning of the end, except as to cotton. The lone one would say there always will be demand for seamless silk unless the cost of the full fashioned is brought down to the level of that for seamless, and he probably is right, but the fact remains that if the rate of increase in full fashioned production this year and last be maintained, the seamless silk stocking may be a rarety in a very few years.

A casual remark that more seamless than full fashioned is being worn by women prompted a glance at the statistics compiled each month by the Department of Commerce from reports of manufacturers. Figures from the reports of 273 identical mills show that in August the output of women's full fashioned silk stockings alone was 1,003,795 dozen pairs, which was 9299 dozens less than the production of all classes of seamless hosiery—silk, rayon, the two fibers in combination and cotton, including mercerized. Leaving out of the reckoning all classes other than thread silk, silk-and-rayon and all-rayon, full fashioned thread silk leads.

Last month there was noted quite a spurt in demand for seamless thread silk and silk in combination with rayon, the latter being in particularly good call. The seamless industry so far as relates to the two types of construction is fast shifting to the South. A southern mill with 145 machines is operating on a 21-hour day schedule, and has been for nearly ten months. Three or four years ago this mill's knitting equipment consisted of but 45 machines. Another southern mill is operating on a 23-hour day schedule and recently increased its production. A few in the North are being run overtime, but in Pennsylvania they are the exception.

One explanation for the seemingly phenominal activity in the establishments referred to is that a great number of mills have ceased to exist. Information from an authoritative source is that in the first half of this year 39 seamless hosiery mills in Pennsylvania went out of business, while several of those which remain have installed or have planned to install full fashioned equipment. Two in Philadelphia and as many in Reading have sold or are offering for sale a large part of their seamless machinery to make room for full fashioned.

By the end of the year E. Sutro & Son Co. will have doubled the capacity of their full fashioned branch factory at York, Pa., The Thomas W. Buck Hosiery Co., Philadelphia, has disposed of some seamless equipment, and an executive said the other day, "we are thinking of installing full fashioned machines." It is pretty generally understood that thinking has led to the placing of a contract for machines.

Some of the seamless machines displaced in northern mills have been bought by manufacturers in the South, and there is a call from that section for more latch needle equipment. For the present, it appears, spring needle silk hosiery will remain largely a northern product. It is in fairly good demand for immediate and nearby deliveries, but little contracting for future months, manufacturers say. The seamless silk-to-top or four-inch welt, in both spring and latch needle construction can, if made to conform to high standards, be readily marked as a dollar a pair proposition, and several lines sold under manufacturers' well known brands are passing over the counter at $1.50.

One of the larger Philadelphia department stores carrying a nationally known brand of women's spring needle hose may be suspected of not pushing the line. The hosiery departmental manager said a few days ago it was useless to discuss seamless silks, "Who's buying them?" he asked derisively. "You have seamless in stock," he was reminded, to which he replied, "yes, and I wish we had none, for we are selling full fashioned 21-inch boot hose at $1.15 a pair."

This is a common price in Philadelphia shops for full fashioned 39-gauge hose with the former standard mercerized top. It sells, because of price, in competition with 42 gauge. The full fashioned people have yet to put on the market a silk-to-top to sell at a dollar, and so long as they do not do so, there will be a place for the seamless of high grade construction. And it is predicted by even some of the full fashioned interests that if the narrowing of the seamless stocking by dropping needles proves a success commercially, the seamless industry will enter upon a new lease of life. Narrowing is being done successfully by this process by the Dexdale Hosiery Mills, and it is believed by persons who have witnessed the operation and inspected the product that it is destined shortly to be as successful in a commercial way as on the scale maintained for experimental purposes.

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In the full fashioned field there will be a further drift to fine gauge, the 42 having to contend with 45 and finer, inside of a very few years, from present indications. In fact, a Pennsylvania manufacturer is experimenting successfully with a 51-gauge stocking intended to compete with fine gauge hose of French construction. In this way and others the full fashioned industry is keeping a step ahead of the seamless and gradually increasing the length of the step.

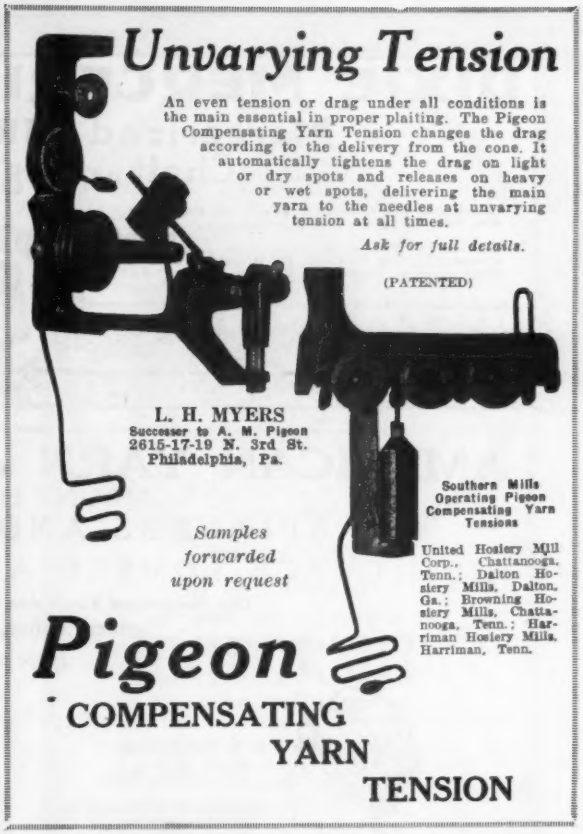
Gun metal hose with black heels is being extensively exploited, and several mills are showing the black heel on legs in light colors. This is not really an innovation, as several years ago the Cadet Knitting Co. brought out a black-heel line, which was sold under the description dark point van dyke. It enjoyed quite a run, but latterly was less in evidence.

Most manufacturers of full fashioned silk give little consideration to innovations in construction, the larger establishments, it is noted, adhering strictly to staples. The Pointex heel is one of few innovations to make a national and lasting hit. Brown, Durell Co. brought out a rival, in the two point heel, described as the Gordon V-line. In September the price was reduced to $19 a dozen from $22.50. That was about the time the Quaker Hosiery Co. of Philadelphia reduced their price for an all-over-silk chiffon to $12 to retailers. The company cut so deep then that no manufacturer tried to follow, and, contrary to expectations, it did not materially affect the market, notwithstanding jobbers were clamoring for lower prices for silk to 5-inch welt. They wanted such a stocking at the price of an 8-inch welt. But manufacturers declined to yield in the firm market. The Quaker Hosiery Co.'s present price to retailers is $12.50, on detailed orders for deliveries through December.

While the Quaker company is selling to retailers at what is, practically, the price of leading mills to jobbers, the larger manufacturers came out about the middle of October with existing prices for the first half of 1926, and the Apex and Berkshire mills are understood to have taken some very large orders. Thus prices are established for at least this year and for the earlier months of 1927.

There is much division of opinion on the question whether semi-sheer silk hosiery will not to a considerable extent displace five-thread chiffons. This is given as one explanation for mills' conservative buying of thrown silk. As details came in last month from jobbers some manufacturers said they were led to believe chiffons "were coming back," and it did look that way to market observers. They seem certain to remain staple for evening wear and dress-up occasion and are regarded the preference for gift purposes. Preparations for the holiday trade contemplates fairly liberal stocking of chiffons. But it is a common admission that their comparatively short term of service make for a broadening field for fine gauge seven and eight thread hose. However, numbers of leading mills are making five-thread sheer exclusively and selling their production.

Three or four small full fashioned mills in Philadelphia are being quietly offered for sale. This would be the more significent if new mills were not being established and existing establishments not augmenting their equipment. No 42 gauge equipment in good order need go begging for a buyer,, but it is not so easy to find a customer for machines of 39-gauge and coarser. Three Pennsyl-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vania manufacturers are known to have contracted for 500 full fashioned machines to be installed next year, and certainly there are others, so that it is quite certain expansion will go on for at least another year: It is estimated that orders for machinery just now total 130 domestic and 150 foreign machines a month, and much of the latter equipment will be of high speed 24-section leggers and 28-section footers.

Underwear.

An accumulation of deferred business in men's heavy weight cotton ribbed underwear came last month in an avalanche of rush orders. Pressure on mills became acute opportunely, serving to hold prices firm while the slide in cotton was causing consternation among light weight interests. The sudden descent in temperatures found jobbers and retailers illy prepared, and there were instances of as many as three orders from a single jobber within 24 hours, according to the management of several mills. Demand for certain mill lines could be truthfully described as phenomenal, and there was no time or inclination to haggle over price so long as goods for immediate shipment could be located. Necessarily there were available supplies of the mongrel, but by no means a surplus of the more desirable. Two manufacturers of well established lines say their 1926 business shattered all records for volume.

The character of the repeat underwear orders disclosed a very healthy situation as among mills and jobbers. The latter will finish the season with practically no high price underwear on inventory, and it appears that retailers who neglected to provide for their late winter requirements may have difficulty later in filling in. This certainly will be their experience if the consumer be as tardy as the retailers have been. But the almost complete cleanup of 1926 goods will be an augury for wholesome conditions early in 1927, after mills have named prices for the next season.

As was foreshadowed in the October issue of COTTON, numbers of manufacturers will not name prices until January for the winter of 1927-8. They have conferred with leading jobbers, and there seems practically unanimity of sentiment in favor of a late opening. This sentiment was crystallizing even before the drop in cotton and the resultant demoralization demonstrated the wisdom of postponement of the formality, several manufacturers stated early in October that they would announce an opening date for their lines without waiting for a declaration by others. At this writing it had not been determined whether the southern group of mills would fall in line with the January opening idea.

Manufacturers in North Carolina and Tennessee who for some years have named prices in January for each of three delivery periods may not, it was feared, be favorable to a deferring of their opening later than December. Usually they book considerable early delivery business, which it is desirable to put through the mill as expeditiously as possible for leaving them in position to take care of the ordinarily heavy summer and early fall volume. The Central West and some leading Mohawk Valley mills are understood to have decided to offer nothing before January, regardless of when the manufacturers in the South come on the market. This presupposes that the latter will be likely to accept some business in December, for it has been customary for them to precede most of the northern concerns by about a month. Those manufacturing heavy weights only, necessarily would be particularly favorable to an

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opening at the earliest possible date consistant with existing conditions.

It develops that little or nothing would have been lost to lightweight manufacturers had their prices not come out before September, instead of June and July. Although they had discounted the cotton market and named comparatively low prices, there has been ultra-conservative contracting by jobbers. It is estimated that by no means 50 per cent as much light weight knit underwear was sold this year to October for 1927 as last year to the corresponding month, for the season recently ended. The average jobber was buying case lots for filling in as late as the early part of last month, but doing practically nothing in goods for 1927.

Now that distributors are looking for downward revisions of the opening prices they are disposed to still further procrastinate. This is making a serious situation for manufacturers of light weights exclusively, and presents no really cheerful outlook for the two-season mills, as, from present indications, they are likely to have much of their summer and winter business crowded into a single season. Obviously, however, there would be some compensation for them in such a situation, in that demand would operate to make for a steady price level for both heavy and light weights. It seems not improbable that once manufacturer and distributor have recovered from the shock caused by the cotton drop and adjusted affairs accordingly, the cotton underwear industry will have benefited rather than suffered from the break in the raw fiber.

It appears to be the general conviction that men's balbriggan underwear is practically doomed. Distributors say nainsooks will continue to gain in popularity, for one reason because leading nationally advertised lines are vigorously exploited and manufacturers are cooperating more closely than ever with distributors. The bals also are in sharp competition with the spring knit, and the intimation is heard that spring needle underwear is to be especially featured by northern mills as a means of meeting competition with the South. It made some headway this year, and some factors predict it will serve to check the drift to nainsooks. One of the better light weight underwear guesses is that knitted shirts and nainsook drawers will prove an attractive combination.

What will be the effect of lower price cotton on the women's cotton underwear industry is a question among manufacturers. With them the majority sentiment is that more of the cotton vests and union suits will be worn; that as prices of silk and rayon are not likely to decline the garment from these fibers will not be materially affected, while with cotton yarns down by 10 to 12 cents from last year the cost difference will be largely in favor of cotton underwear that, with its absorbant characteristic also in its favor, it will have a much broadened market.

Women's cotton underwear manufacturers up through Pennsylvania have had a fairly profitable light weight season and right well supplied with business in medium weights. Barring the possibility of the necessity for price revisions on the latter, these manufacturers express themselves as hopeful of a materially larger volume of business in 1927 than this year.

Sweaters.

Sweater manufacturers, many of them, are operating plants overtime, in contrast with much idleness three months ago. Pressure upon them never was so great, it is stated. Numbers of mills in Philadelphia and Cleveland are known to have declined orders last month, being sold up to the end of the year. Southern jobbers are mentioned as placing orders very freely. Demand is general, however, particularly strong in the Central- and North-West.

Shaker knit coats, for men and women, are in especially strong call, and there is a good outlet for sports sweaters in conservative models. The volume business is in men's and boy's sweaters. There is, however, more interest in women's knitted coats as a part of two-piece suits. While many sweater mills are having offered to them more business than can be taken care of, those which finish the year on as large a volume of business as in 1925 will be few.

Some of the bathing suit manufacturers are sold well up for the next season, and with the opening of sweater lines in November for the 1927 season it is thought most of the jobbers who have deferred their operating in bathing suits for next year will be placing their initial orders.

Changes Selling Method.

Of interest in the underwear trades is the recent action of the manufacturers of B V D underwear by which the distribution of the line in the Philadelphia territory is restricted to but one jobber, whereas until the beginning of October it was divided among five. The sole distributors now are the newly organized corporation Schofield Shelmire Co., in which the principals are John H. Schofield, of J. H. Schofield & Co., and J. Malcom Shelmire, who was underwear buyer for the Sheibley Taylor Co. When he quitted that concern Mr. Shelmire was believed to have assurance that his new company, having absorbed the J. H. Schofield company, would be favored by the B V D Co., but the trade was not prepared for that company's announcement that the Schofield Shelmire corporation would be made sole distributors in Philadelphia, three old, well known, houses being eliminated. These are the Joel Bailey Davis Co., Markovitz Brothers and the Sullivan Smythfield Co. The territory comprises Pennsylvania east of the Susquehanna River, New Jersey except the New York metropolitan district, Deleware and the Eastern shore of Maryland.

The Schofield Shelmire Co., prefer to be known as wholesale distributors for manufacturers of nationally known brands of underwear, hosiery and sweaters. The term "jobbers" is in disrepute, say other jobbers. "There is something so unsavory about it," said one, "that we would rather be referred to as wholesale distributors, a term which we believe is much more appropriate. The standard dictionary defination of "Jobber" is enough to condemn it as not applicable to large, reputable wholesale establishments. The word is appropriate enough as a term designating dealers in job lots or persons indulging in the kind of jobbery so often seen in politics."

"Ball Bearings for Electric Motors," a new booklet issued by The Fafnir Bearing Company, New Britain, Conn., discusses the subject in a way to present to the user of motors the story of the savings and economies of ball bearing motors. The material in the booklet contains facts, figures and quotations from men and experiences, supported by experience records. The compiled information is of a scientific character and covers the subject in a very thorough manner.